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# BEEF'N BACON

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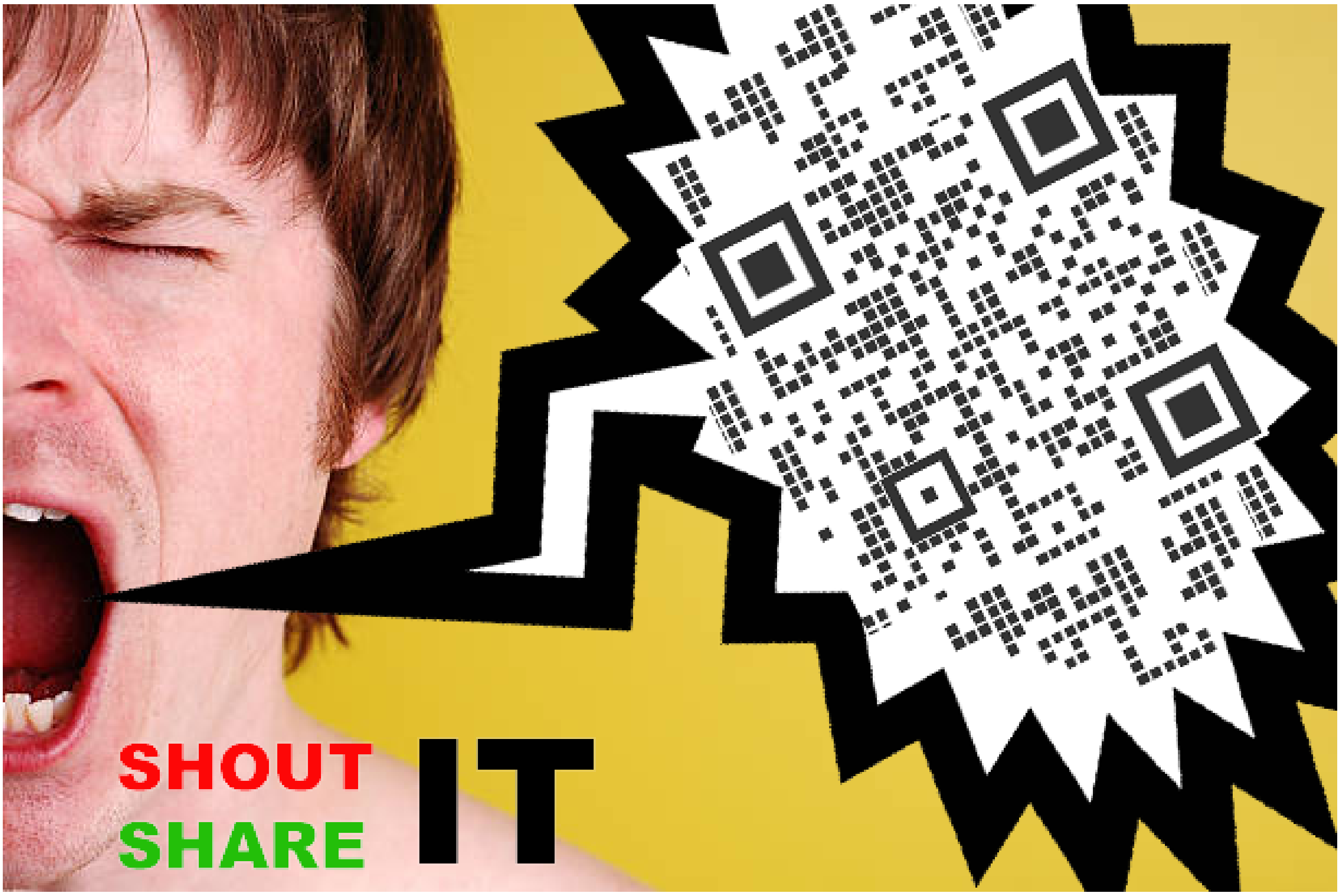
SHOUT
SHARE
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## INTRODUCTION

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More information on all articles is available by contacting your District Agriculture Office or:

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# RED MEATS

## RED MEATS ARE FINE

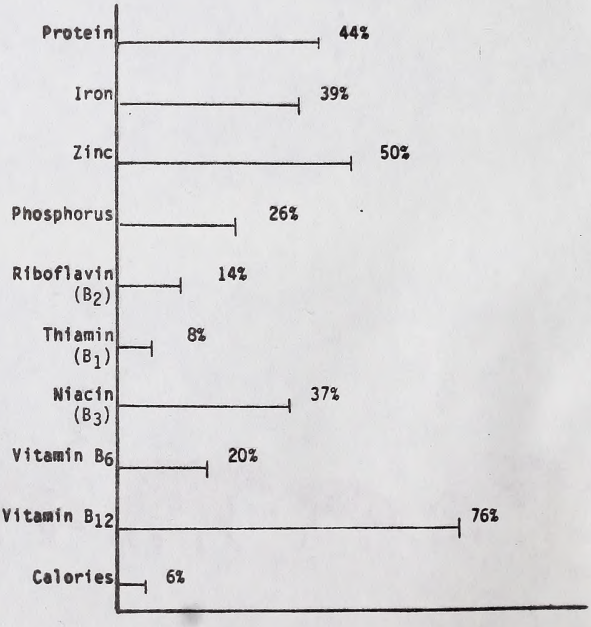
I often hear people saying that they don't eat red meat anymore. When pressed for a reason they say there's too much cholesterol and saturated fat or it causes cancer. Recent research does not support any of these statements.

Today, Canadian red meats are leaner due to changes in the breeding, feeding, and grading. The fat and cholesterol content of red meats is comparable to fish and poultry.

It has been pointed out that Seventh-Day Adventists don't eat meat and have a very low incidence of colon cancer. However, Mormons eat meat and they likewise have a low rate of colon cancer. What both groups have in common is the avoidance of caffeine, alcohol, and tobacco.

Besides being low in fat and cholesterol, red meats are packed with many important nutrients. An adult male eating a 3 oz. (90 gm) serving of cooked lean beef would obtain 44% of his protein needs for the day. Also he would obtain 39% of his iron, 50% of his zinc and many other nutrients (refer to the chart on the right). Yet, the 3 oz. of beef contributes only 6% of his energy requirements.

You can't go wrong with red meats as a nutritious food choice for a moderate well balanced diet.



% NUTRIENT INTAKE CONTRIBUTED TO AN ADULT MALE'S DIET BY 3 oz. OF LEAN COOKED BEEF.

# SPLIT SUCKLING IMPROVES PIGLET SURVIVAL

The Dairy Industry has coined the slogan "Milk, It Does A Body Good". The same catch phrase should be part of every swine producer's thinking when it comes to improving baby pig survival. The struggle to obtain milk is a stressful competitive business. A newborn pigs' ability to survive and fend off disease hinges on its chances of obtaining sufficient amounts of milk, especially colostrum, from the sow immediately after birth. Smaller, weaker pigs are at a disadvantage as they often do not get their fair share.

## A TIGHT SCHEDULE

Piglets usually suckle 15 to 20 times in a 24-hour period. Even though nursing may last for two to three minutes, milk let-down only occurs for about 20 seconds during that time. Getting the colostrum needed for immunity must take place within the first 24 hours. The smaller the piglet the more likely it will miss out on these opportunities.

## IMPROVING THE ODDS

Producers can improve the chances of smaller, weaker pigs getting their share of the colostrum and milk by practicing a procedure called split suckling. The procedure allows the smaller pigs in the litter their own chance on the udder. Improvements in piglet survival and weight gain are the benefits as shown in the following results:

| | LARGE PIGLETS | | SMALL PIGLETS | |
|---|---|---|---|---|
| | CONTROL | SPLIT SUCKLED | CONTROL | SPLIT SUCKLED |
| % GAIN OVER BIRTH WEIGHT | | | | |
| 0 - 24 Hours | 0.0 | 0.0 | - 15.8 | 3.8 |
| 24 - 48 Hours | 77.6 | 84.1 | 80.6 | 115.2 |
| 0 - 20 Days | 273.5 | 307.4 | 333.8 | 391.4 |

SOURCE: ADAS, 1983

## SPLIT SUCKLING PROTOCOL

The following example outlines the procedure that can be used to ensure smaller piglets get a longer unharassed period on the udder:

- Split the litter by weight --- heavier and lighter pigs.
- For example, in a litter of 10 pigs lock the 4 heaviest or biggest pigs in a 32°C creep area for the first one-half to one hour after birth.
- Next, allow the 6 smaller pigs to suckle for one-half to one hour. Spray mark these pigs.
- Allow the larger pigs to rejoin the smaller ones.
- Repeat the process 12 to 18 hours later.

# MEETING WEANER PIG NEEDS

In nature, weaning is a gradual process. Piglets consume more solid feed as the sow's milk supply dries up. In modern pig production weaning is usually abrupt. Weaning often occurs as early as three weeks with piglets changing from a milk-based diet to a solid feed-based diet overnight. This stress along with changes in pen environments and social groups can cause severe problems. For optimum growth rates producers must take counteractive measures to minimize these stresses.

## TEMPERATURE CONSIDERATIONS

One of the biggest problems is creating the ideal environment for the newly weaned often very small pig. Ideally, pigs weaned at three weeks of age require a minimum environmental temperature of 30°C. The temperature can be gradually lowered so that by three to four weeks after weaning the temperature at pig level is around 24°C.

Temperatures must meet the needs of the most disadvantaged pigs. Temperature requirements vary depending on feeding levels, floor types and air speeds. Air speeds in weaner pens should not exceed 0.15 metres per second, except when a cooling effect is desired.

## SPACE REQUIREMENTS

Between three and six weeks of age, weaners should at least double their weight. Pens can soon become overcrowded. Pigs need space for lying, feeding, dunging and escaping. The total space provided should never be less than 25% more than the lying area. The table to the right can be used to determine lying area needs. Never put more than 20 pigs per pen in a nursery or flat deck system.

| Pig Weight (kg) | Lying Space/Pig ($m^2$) | Lying Space/Pig ($ft^2$) |
|---|---|---|
| 5 | 0.07 | 0.75 |
| 6 | 0.10 | 1.08 |
| 20 | 0.15 | 1.61 |
| 30 | 0.20 | 2.15 |

## PROVIDING THE RIGHT FEEDING PROGRAM

- For pigs weaned at 5 to 10 kg, a 20% crude protein or an 18% crude protein plus 1.15% lysine diet is recommended. Improve growth rates and feed efficiency by placing an antibiotic in the feed.
- Minimize chances of scours by restricting feed intake for the first few days post-weaning. Feed ad-lib once pigs are accustomed to solid feed.
- Provide plenty of feeder space. Put an extra feeder in the pen during the first week. After that 3 to 4 inches of trough space per pig is adequate.

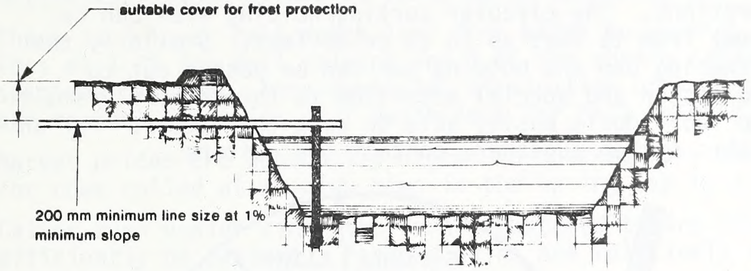
## ACHIEVING HIGH GROWTH RATES

Achieving a target pig weight of 30 kg at 10 weeks of age is not unrealistic. The following table outlines target weight for age under optimum housing (ADAS, 1987).

| Age (weeks) | Liveweight (kg) | Daily Gain (grams) |
|---|---|---|
| 3 | 6.0 | 271 |
| 4 | 7.9 | 271 |
| 5 | 10.3 | 343 |
| 6 | 13.0 | 386 |
| 7 | 16.4 | 486 |
| 8 | 20.3 | 557 |
| 9 | 24.8 | 643 |
| 10 | 30.0 | 743 |

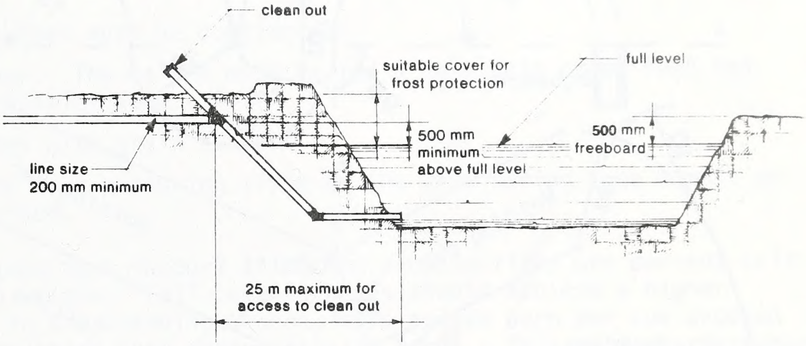
# EARTHEN LIQUID MANURE STORAGE

Following are two methods of earthen storages with gravity drainage lines.


suitable cover for frost protection
200 mm minimum line size at 1% minimum slope

Option 1:
Above liquid discharge. Subject to ice build-up in storage, but most reliable. Creates more storage disturbance, therefore, more odor and nutrient loss.

Option 2:
Below liquid discharge. Preferred for lagoon management.

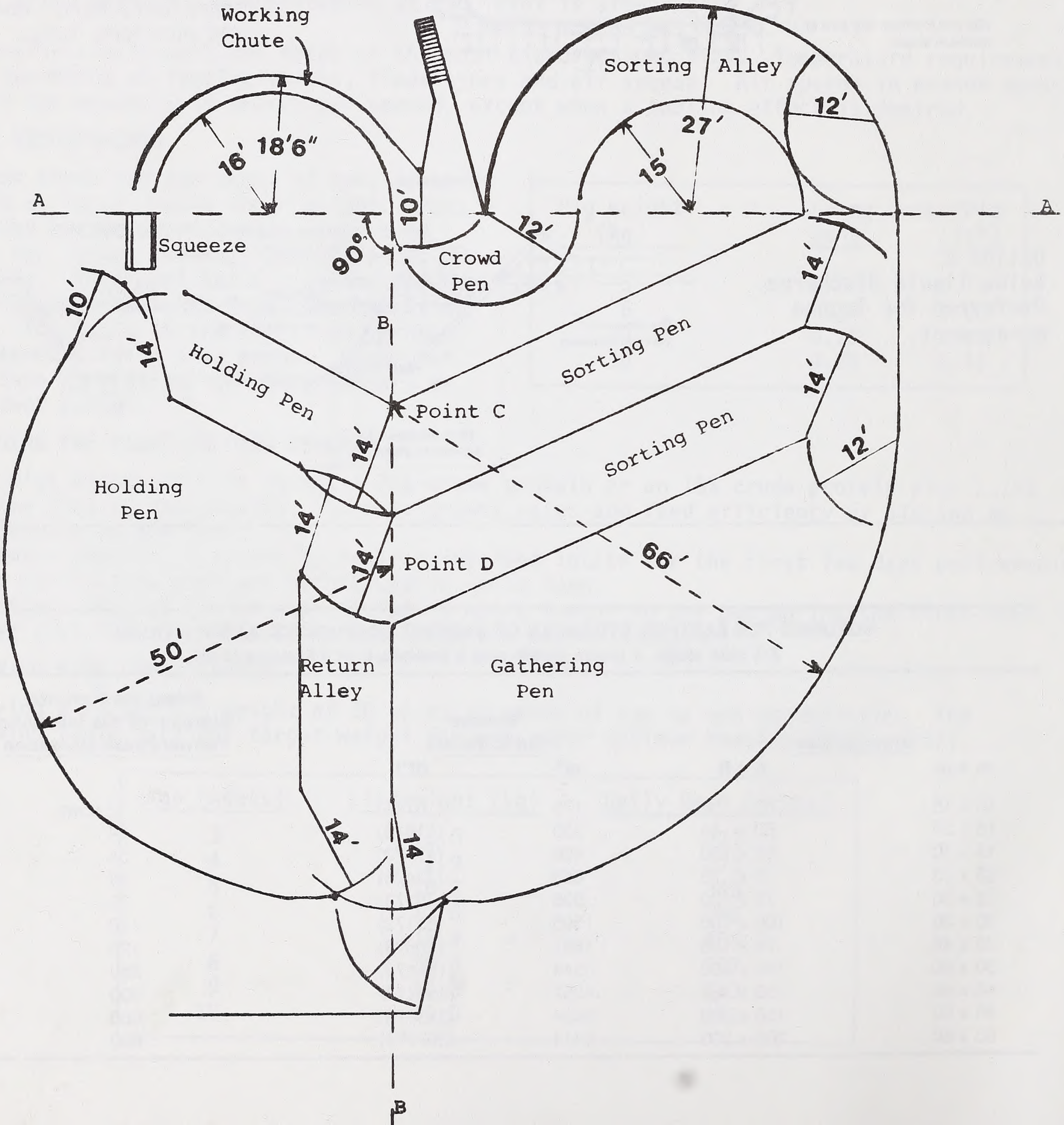

clean out
suitable cover for frost protection
full level
500 mm minimum above full level
500 mm freeboard
line size 200 mm minimum
25 m maximum for access to clean out

**VOLUMES FOR EARTHEN STORAGES OF VARYING DIMENSIONS. ASSUMPTIONS**
**2:1 side slope, 3 metre depth and a freeboard of 0.5 metre (2 ft).**

| Storage Size<br>m x m | <br>ft x ft | Volume Cubic Metres<br>m$^3$ | <br>(ft$^3$) | Adequate 6 month Storage for the following Farrow-Finish Operation |
|---|---|---|---|---|
| 15 x 15 | 50 x 50 | 175 | ( 6173) | 12 sows |
| 15 x 23 | 50 x 75 | 330 | (11673) | 24 |
| 15 x 30 | 50 x 100 | 486 | (17173) | 35 |
| 23 x 23 | 75 x 75 | 663 | (23423) | 48 |
| 23 x 30 | 75 x 100 | 996 | (35173) | 70 |
| 30 x 30 | 100 x 100 | 1505 | (53173) | 110 |
| 23 x 46 | 75 x 150 | 1661 | (58673) | 120 |
| 30 x 60 | 100 x 200 | 3544 | (125173) | 250 |
| 46 x 46 | 150 x 150 | 4252 | (150173) | 300 |
| 46 x 90 | 150 x 300 | 9434 | (333173) | 650 |
| 60 x 60 | 200 x 200 | 8414 | (297173) | 600 |

# LARGE CIRCULAR WORKING CORRAL

Designing and building a working corral will be a once in a farming career project for most cattlemen. It is therefore necessary that the handling system be workable and able to accommodate future production changes. Here is a design intended for herds in excess of 150 breeding cows. The number of sorting pens can range from 1 to 3 or 4 depending upon the requirements of the operations. The circular sorting/holding area can be expanded by increasing the diameter from 15 feet up to 25 or 35 feet. Similarly the perimeter fencing in both the gathering pen and holding pen can be pushed out to accommodate larger herds. A good design and special attention to the seemingly small factors will result in one or two individuals easily able to work the cattle. For an instruction sheet on how to put this system together, contact the editors.


Working Chute
16'
18'6"
A
A
10'
90°
Squeeze
Crowd Pen
12'
Sorting Alley
27'
15'
12'
10'
14'
Holding Pen
B
Point C
Sorting Pen
14'
Sorting Pen
14'
12'
Holding Pen
14'
14'
14'
Point D
66'
50'
Return Alley
Gathering Pen
14'
14'
B

# FALL CALVING BEEF COWS

There is renewed interest in calving beef cows in mid August and September. Producers who are already fall calving list many benefits. Here are some benefits:

(1) Cows have higher conception rates and give birth to stronger calves that require little assistance either at birth or in mothering up.

(2) There is a lower calf death loss from birth to weaning. One report cites calf death loss at 1.2% for fall calving and 5.6% for spring calving cows. Calving on dry spacious pastures, less dystocia, elimination of scours, and generally less stress are reasons for a low calf death loss for fall calving cows.

(3) Market prices are seasonally higher for weaned fall born calves (3 to 5% premium) and for cows culled at weaning time in the spring (up to a 24% premium).

(4) Calves wean easier since they are accustomed to dry feed and weaned calves gain efficiently on pasture. Pasture gains are relatively inexpensive as compared to winter gains for spring born calves.

(5) In blackfly areas, fall born calves are born after the fly problem and there is no blackfly problem during the winter breeding period.

There are several disadvantages that must be considered:

(1) Winter feed costs are higher. The calves must be fed a palatable creep feed and the cows will require top quality feed.

(2) The calving season coincides with grain harvest.

(3) It is advisable to have the cows pasturing close to the yard during late summer so that calving can be supervised.

For beef cow enterprises, two important factors affecting profitability are percent calf crop weaned and average weaning weight. Fall calving herds should achieve a higher percent of calves born earlier in the breeding season, more calves born per cow exposed and a lower calf death loss to weaning than spring calving herds. This extra performance is offset by the cost of providing creep feed to the calf and higher quality feed to the cow. With todays feed, pasture and market prices, the following table is applicable.

| | Calving Season | |
|---|---|---|
| | Spring | Fall |
| calf crop weaned/cow exposed % | 82.9 | 86.9 to 88.9 |
| average weaning weight | 495 lbs | 515 lbs * |
| lbs weaned/cow exposed | 410 lbs | 447 to 457 lbs |
| @ 3 to 5% price premium | 410 lbs | 460 to 528 lbs |
| @ $1.10/lb | $451 | $506 to $528 |
| Difference | -- | + $55 to $77 |

* Fall born calves could weight 20 lbs more since they are born earlier in calving season

A calculation of extra feed inputs (partially offset by reduced pasture costs for the cow) shows that production costs are approximately $35 higher. The potential $55 to $77 extra return should more than offset the anticipated increased production costs for fall calving herds.

# PREGNANCY TESTING - IS IT WORTH IT?

Lets look at the economics of pregnancy testing the beef herd. We may find some extra dollars or save a little feed to make the decision worthwhile.

The following table assumes a 100 cow herd is pregnancy checked in October, 8% of the cows are open, winter feed costs are $175/cow, the opportunity cost of money is 8% and cull cow prices increase 10¢ from fall to spring.

| | Herd of 100 Beef Cows | |
|---|---|---|
| Pregnancy Check | Yes | No |
| cost of preg. check (100 x $1.50) | $150.00 | -- |
| # identified open & sold in fall | 8 | -- |
| cost of extra winter feed | -- | 8 x $175/head = $1400 |
| opportunity cost @ 8% for 6 mos. | -- | 8 x 1200 lbs x 8% @ 6 mos = $192 |
| price increase from fall to spring @ 10¢/lb | 8 x 1200 lb x 10¢ = $960 | -- |
| Trucking (same for both groups) | -- | -- |
| Total Cost | $1110.00 | $1592.00 |
| Extra Cost | | + $482.00 |

In this example, the decision to pregnancy check in October has decreased the production costs by $482.00 for the herd. The costs have been decreased in spite of the market value for cull cows increasing a dime from late fall to spring selling dates. For producers who pregnancy checked the herd in late August or early September, cull cow market prices are seasonally higher than in late October or November. These producers will have received an additional $40 to $60 for the cull cow or $320 to $480 for the 8 animals culled as compared to cull cows marketed in late October or November.

Skeptics may argue with my figures so lets approach the question from a different angle. What percent open does a veterinarian have to find to make pregnancy checking worthwhile? Using the above assumption, finding 1.5% of the cows open will pay for the additional costs of pregnancy checking.

Veterinarians usually charge for pregnancy checking either on an hourly basis or on a per head basis. Those producers with good handling facilities will benefit since the veterinarian is able to work steady and the pregnancy checking gets done sooner.

Pregnancy checking has other advantages in addition to identifying open cows. It acts as an early warning system. It can identify cows that conceived late in the season. By identifying these cows, the decision can be made to keep or sell. In addition, breeding trouble may be identified, such as infertility in the bulls or problem breeders in females.

Open youthful cows could be put on a 60 day grain feeding period and achieve 2.5 to 3 lbs per day. Cows less than 5 years of age have the potential to grade A, B or C. If rail graded after the grain feeding period and an A grade is achieved, rather than getting the $1.00 to $1.10/lb for D1, D2 cows on the rail, the A price might be $1.40 to $1.45/lb.

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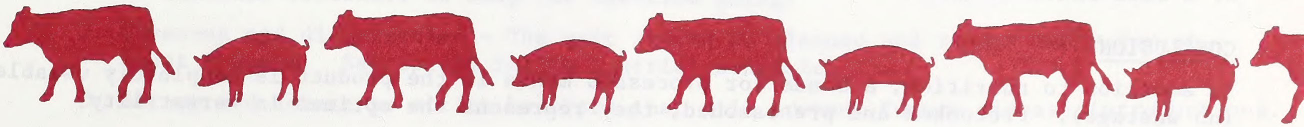

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# RED MEATS

## PROCESSED MEATS HAVE QUALITY

Choice is the word to describe Canadian processed meats as there are over 300 varieties available. The wide selection is due to various combinations of meat, spices, flavorings, and processing procedures (eg. curing or smoking). The resulting end products are flavorful and nutritious and with the availability of refrigeration provide convenience and variety.

### INGREDIENTS

Only federally inspected meat is used to make Canadian processed meats. In September 1985, standards were set for the minimum meat protein and minimum total protein content of processed meats.

All food additives must be used in amounts approved under the Food and Drug Regulations. Salt is an important ingredient which improves quality, enhances flavor, and helps preserve processed meats. New technologies have allowed less sodium to be added. For example, ham and bacon have 25% less sodium than 25 years ago. Curing agents are used to prevent spoilage and improve color and flavor.

The processing technique chosen further develops the flavor. The choice of procedures is wide and includes curing, smoking, heating, chilling, fermentation, and drying.

Fat is another necessary ingredient, improving the flavor and the eating quality. The new "light" processed meats are available for consumers wishing to moderate their fat intake.

### NUTRITIONAL QUALITY

The protein quality of processed meat is high. The mineral content is comparable to fresh meat. Vitamins $B_2$, $B_3$, and pantothetic acid are stable to processing, however there is some loss of vitamins $B_1$, $B_6$ and $B_{12}$. Processed meats may be used in moderation as part of a well-balanced diet.

### CONCLUSION

In addition to nutrition, a bonus for processed meats is the product is completely useable (no wastage). Precooked and preseasoned, they represent the optimum in versatility, flavor, and convenience.

# DEPOPULATING REQUIRES SERIOUS CONSIDERATION

Repopulating the swine herd as a solution to disease problems has gained popularity. The decision to depopulate a herd is one of the most important decisions that has to be made for a pig unit. Without careful planning, the process can often end up costing the producer more than the original problem.

## SETTING YOUR OBJECTIVES

In order for depopulation-repopulation to be cost effective producers must set the following objectives:

- Improve and maintain hi-health for at least 3 years.
- Improve herd genetics.
- Reduce days to market by 14 to 21 days.
- Improve feed efficiency by 0.1 to 0.4.
- Achieve a 90% farrowing rate.
- Attain 10 pigs weaned per litter.
- Reduce post-weaning mortality to less than 3%.

Achieving a minimal level of disease can have various effects on overall performance. The table to the right illustrates the effects on days to market and backfat levels after restocking.

EFFECTS OF MINIMAL DISEASE

| | Before | | After | | Improvement | |
|---|---|---|---|---|---|---|
| | B.F. | Days | B.F. | Days | B.F. | Days |
| Hamp. Boars | 12.5 | 163 | 13.4 | 135 | + .9 | -28 |
| Hamp. Gilts | 13.5 | 167 | 15.0 | 142 | +1.5 | -25 |
| Duroc Boars | 12.7 | 171 | 15.3 | 131 | +2.6 | -40 |
| Duroc Gilts | 14.1 | 165 | 19.4 | 136 | +5.3 | -29 |

Source: Fast, 1986

## ASSESSING DISEASE PROBLEMS

Often one disease does not justify herd depopulation. Diseases that have been identified for consideration in depopulation include atrophic rhinitis, enzootic pneumonia, haemophilus pneumonia, swine dysentry, TGE, streptococcal meningitis, pseudorabies and mange. In assessing the disease situation in your herd the following steps should be taken:

- Make a list of diseases known to be present in your herd. Can they be eliminated through depopulation and proper management?
- Estimate the cost of these diseases in medications, mortality and lost production. Remember that lost production can be influenced by factors other than disease.

## TAKING THE PLUNGE

Once you have decided to repopulate with minimal disease stock consider:

1. Downtime - The absolute minimum loss in time would be about 30 weeks. Can pigs be finished elsewhere to keep the cashflow going?
2. Clean-up and disinfection - The unit should be cleaned and remain empty for at least 8 weeks. Set up and follow a strict schedule.
3. Set-up and adhere to strict barriers that will prevent future disease introductions.
4. Seek advice on the health status of the donor herd. Involve your veterinarian in your decisions.

# MINIMIZE INFLUENCES ON FEED INTAKE

A major cause of variations in growth rate, feed efficiency and carcass quality is feed intake. In some units producers have problems in getting pigs to consistently eat enough. Although it has been suggested there may be a breed or type effect on appetite, it may be necessary to assess what influences pig feed intake.

## FEED INTAKE DEFINED

Eating behavior can be divided into two phases:

- Appetite phase - locating and positioning at the feed source.
- Consumption phase - actual ingestion of feed.

Pigs are readily able to regulate feed intake by balancing energy intake against loss and nutrient intakes against needs. Hunger arises when a pig detects a physiological need for feed; eating reduces the hunger. Appetite, on the other hand, is the pleasant anticipation of feed.

## INFLUENCE OF WATER

Pigs generally drink with their meals with over 75% of the daily water intake occuring during this time. Alternatively, pigs generally eat little if no drinking water is available. Drinking water is a response to get the pig's body back to normal osmotic and body fluid conditions. Pigs drink while eating in anticipation of needing water soon.

## ENVIRONMENTAL INFLUENCES

### 1. Barn Conditions

Barn temperature, air movements and pen conditions all dictate how much a pig will eat. The optimum temperature for feeder pigs has been determined to be 20°C. On average for every 1°C drop in temperature below this level the pig requires an additional 45 g of extra feed to account for heat loss. Under practical conditions the pig usually increases by only 20 g per 1°C. As a result, growth rates are generally reduced.

### 2. Social Interactions

Social order in group-housed pigs determines accessibility to feed and water. In large groups where rank order is not constant, fighting at the feeder may prevent a pig from getting a meal. Research has shown that low-ranking pigs gain slower. Adequate pig space and group size is crucial in ensuring every pig has unlimited access to feed.

### 3. Feeder Accessibility

Under ad-libitum feeding a general rule of thumb is to provide one feeder space for every four pigs. Ratios below this result in reduced performance.

The feeding space required for a pig depends on its body size as well as the location and type of feeder being used. To prevent interference at the feeder additional space is required in the pen for pigs who are not eating. In order for pigs to eat and move in and out of wall-mounted feeders the following space allowances should be met.

For a group of 8 pigs using a centrally-located circular feeder, the diameter at the lip should be 43 cm (pen size 1.55 m x 1.55 m) and 73 cm (pen size 1.55 mm x 1.55 m) for 20 kg and 100 kg pigs respectively.

| | Wall Feeder Required Space (cm) | |
|---|---|---|
| Pig Weight | Shoulder width | Feeder to Opposite Wall |
| 20 | 19 | 135 |
| 60 | 27 | 195 |
| 100 | 32 | 230 |

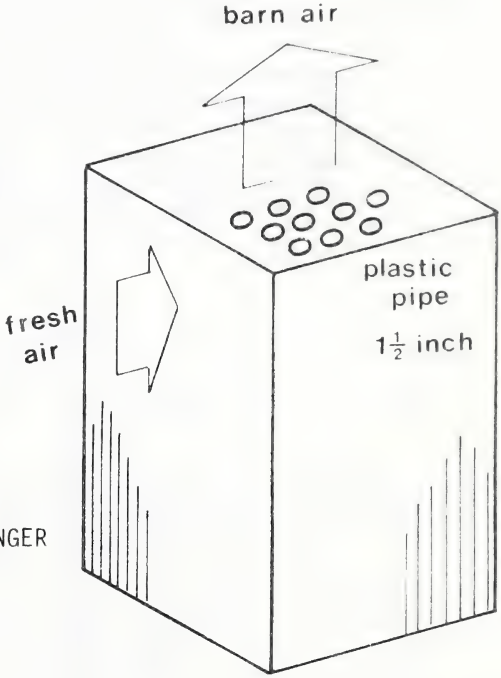
Source: Curtis, 1987

# BUILD YOUR OWN HEAT EXCHANGER

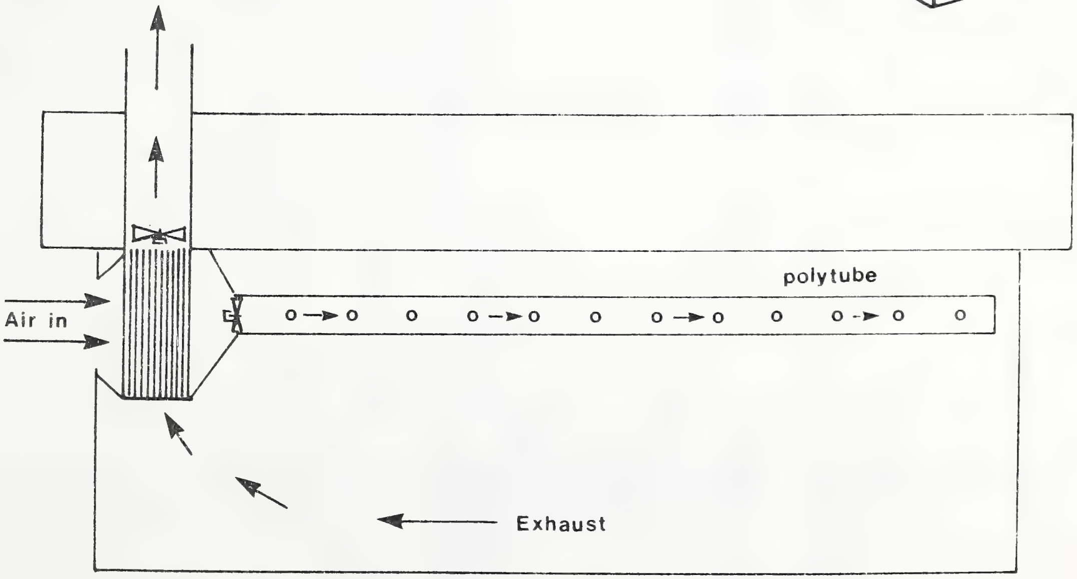
Freezing is not a problem with this home-built, medium efficiency heat exchanger. In addition, pipes are large enough that condensation washes off any dust build-up.

The diagrams below illustrate how the heat exchanger is constructed and fitted in a barn. Connected to a polytube it provides excellent air distribution. The typical design uses 1½ inch diameter thin wall plastic tubing. A total of 220 five-foot lengths of pipe are placed in a 3 ft x 3 ft x 5 ft box. Exhaust air is blown through the pipes. Fresh air is drawn across the warm pipes.

Detailed plans are available from Regional Agricultural Engineers.



SCHEMATIC
SHELL AND TUBE HEAT EXCHANGER



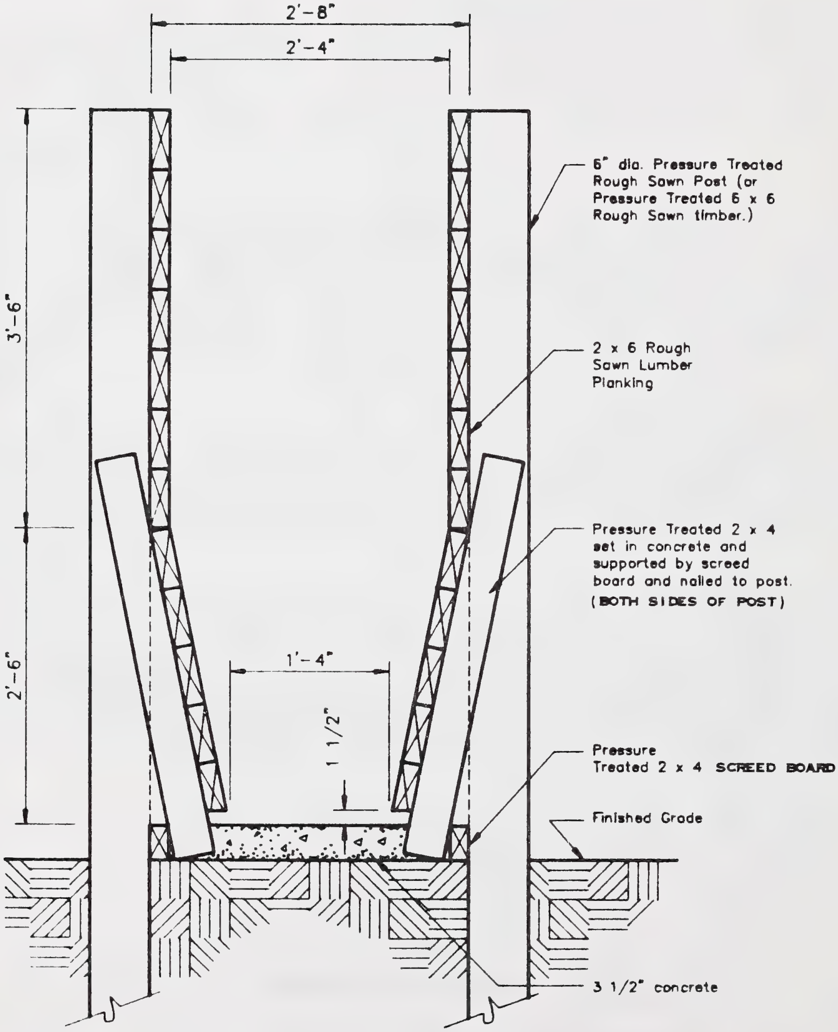
**Shell and Tube Heat Exchanger**

BARN INSTALLATION

# TAPERED SINGLE FILE WORKING CHUTE

The width and shape of a single file working chute is critical, otherwise small or young animals will turn around and create problems. To make a single file chute universal for both large and small animals, it is necessary to taper the bottom 30 inches, as illustrated in the diagram. Do not build the single file chute wider than 30 inches. The 28 inch width in the diagram is sufficiently wide for Alberta cattle.

Curved working chutes work better than straight working chutes. Placing posts 6 ft. apart on the outside diameter will allow for a gradual curve. (The single file chute can be 20 to 50 feet long.) Make the sides of the chute solid by keeping the planks together. The solid sides block out visual distractions. A minimum 1½" space at the bottom of the chute will prevent planks from rotting and allow for clean out. Build a catwalk on the inner curve of the single file working chute. The catwalk will be 36 inches from the top plank of the single file working chute.


2'-8"
2'-4"
3'-6"
2'-6"
1'-4"
1 1/2"
6" dia. Pressure Treated Rough Sawn Post (or Pressure Treated 6 x 6 Rough Sawn timber.)
2 x 6 Rough Sawn Lumber Planking
Pressure Treated 2 x 4 set in concrete and supported by screed board and nailed to post. (BOTH SIDES OF POST)
Pressure Treated 2 x 4 SCREED BOARD
Finished Grade
3 1/2" concrete

**WORKING CHUTE – SLOPING SIDES** w/Plank Siding
Scale 1" = 1'- 0

# PROCESSING & MANAGEMENT OF NEWLY ARRIVED CALVES

Newly arrived cattle or freshly weaned calves need special attention as most feedlot operators know. Management is critical until the cattle are eating well and have adjusted to their new home.

The induction program will differ depending upon history of calf and experience of that particular operator. For example, the time to process calves. Processing on arrival is stressful but the protection from a vaccination begins quickly. Others argue that stresses of shipping and adjusting to a new environment may cause cattle to not develop a satisfactory immunity to the vaccination and the stress of processing increases the chance of sickness. Discussing these kinds of questions with a knowledgeable veterinarian skilled in feedlot diseases and management is desirable. Work together with your veterinarian and nutritionist to prepare a workable induction program.

Here are some guidelines to keep in mind when starting cattle:

1. Start cattle in small pens. Excess stress can be minimized if pen numbers are less than 150 head; and if cattle are sorted by size, uniformity and sex. New cattle can be mixed with others after 30 days in the lot. Avoid overcrowding. Calves require 40 - 50 sq. ft. and yearlings require 50 - 100 sq. ft. per head. Both calves and yearlings require 12 inches of bunk space.

2. Remove old feed from the bunks and clean and drain the water troughs. Be sure cattle know where waterers are located. Observe water consumption especially for newly weaned calves whom are accustomed to getting water only from dugouts or streams.

3. Start cattle slowly on feed. Cattle should first have access to hay after arrival and then access to water. If incoming cattle overload on water, intake of dry feeds will be reduced for first 24 hour period and extra stress is induced. Feed long hay if calves have difficulty accepting a mixed ration. Some feedlot operators will put dry hay over silage in the bunk for the first 3 to 4 days in the lot. This introduces the calves to silage. Feed a mixed starting ration containing 30 - 45% rolled grain with supplements. The supplements should contain all natural protein. Vitamin ADE should be provided in the feed and injected at processing time. Provide a loose salt, adequate in all trace minerals.

4. Observe cattle closely. Liberal use of a thermometer can assist in early detection of a problem. Temperature check incoming cattle. Isolate and treat an animal whose temperature is over 40°C.

5. Avoid muddy pens or dirty conditions. Provide protection (manure pack, windbreak fence, open front sheds) against the weather.

Processing or the procedures carried out at arrival time could include:

- Vaccination - I.B.R., P13 and blackleg (Hemophilus and B.V.D. are optional); implant, dewormer; I.D. (branding, eartags); lice and warble treatment; Vitamin ADE; and temperature check.

# SOURCES OF CATTLE MARKET INFORMATION

If given quality information, we should be better equipped to make intelligent and hopefully profitable choices when marketing cattle. Radio, T.V. and newspapers are common sources of daily information on commodity prices and world wide disasters which affect price. Direct discussion with auction market or packer personnel by phone or having them view your cattle on the farm is effective for determining the value of your cattle. However, it is useful to be market knowledgeable over a broad period of time so that one can better assess the information. It is wise to get information from more than one source. Here is a partial list of information sources.

## PARTIAL LIST OF CATTLE MARKET INFORMATION

| Source | Comments |
|---|---|
| Market Information Center<br>Alberta Cattle Commission<br>#241, 2116 - 27th Ave., N.E.<br>Calgary, Alberta T2E 7A5 | Slaughter Cattle - 1-800-332-1194<br>Feeder & Stocker - 1-800-332-1195<br>24 hour toll free<br>update twice daily |
| The Weekly<br>Alberta Agriculture<br>Market Analysis Branch<br>7000 - 113 Street<br>Edmonton, Alberta<br>T6H 5T6 | Livestock, grains, and oilseed review<br>$25.00/year fee<br>For those with a computer and modem, the Weekly can be accessed at 556-4104 after business hours on the Compu-Farm RBBS (no charge) or on Grassroots. |
| Canfax<br>#238, 2116 - 27th Ave., N.E.<br>Calgary, Alberta<br>T2E 7A6 | Weekly newsletter<br>Cow calf operators $70/year<br>Feedlots (cost depends on size but starts @ $95/year). In addition to newsletter feedlots receive 1-800 information number and can directly discuss market with an analyst. |
| Agriculture Canada | Weekly newsletter of Alberta markets<br>Free of charge<br>Summary of Livestock Sales and Prices<br>Edmonton Public Stockyards-420-3333<br>Southern Alberta Livestock Market Report<br>Lethbridge, Innisfail, Olds, Fort MacLeod, High River, Calgary - 292-5635 |
| Doane's Agricultural Report<br>11701 Borman Drive<br>St. Louis, Missouri<br>U.S.A. 63146 | Weekly analysis of markets<br>$62.00 U.S. per year |

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# BEEF 'N' BACON

Alberta
AGRICULTURE

DECEMBER 1987 VOL. 3, NO. 3

CANADIANA
JUL 14 1992

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## INTRODUCTION

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Diane Bourne, Food and Nutrition Specialist
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Red Deer Regional Office
Marvin Salomons, Swine Specialist
Dale Zobell, Livestock Specialist
Robert Borg, Agricultural Engineer

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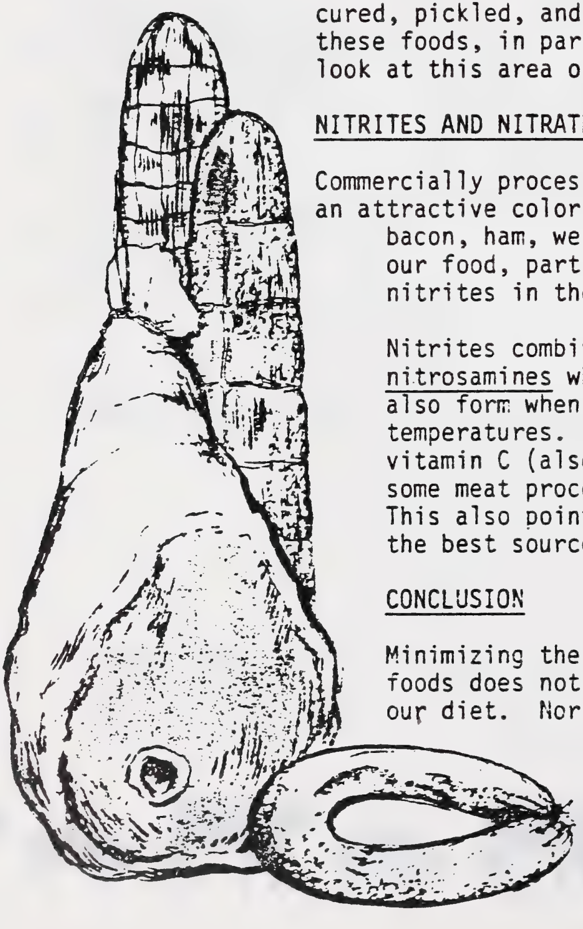
# RED MEATS

## NITRITES AND CANCER

Our diet and its relationship to cancer is a popular topic in today's press. The Canadian Cancer Society promotes good nutrition as one defence against cancer and has developed six dietary guidelines. One of the six recommendations is to minimize our consumption of salt-cured, pickled, and smoked foods. Does this mean we should eliminate these foods, in particular processed meats, from our diets? A closer look at this area of concern may not lead you to that conclusion.



### NITRITES AND NITRATES

Commercially processed meats often have nitrite added to give them an attractive color and to prevent spoilage. These meats include bacon, ham, weiners, bologna, etc.. Nitrates occur naturally in our food, particularly in vegetables and can be transformed into nitrites in the body.

Nitrites combine with proteins in the intestine to form nitrosamines which are cancer causing or carcinogenic. Nitrosamines also form when cured meats (eg. bacon) are fried at high temperatures. The formation of nitrosamines is inhibited by vitamin C (also known as ascorbic acid or ascorbate). This is why some meat processors are adding these substances to their products. This also points out the importance of eating fruits and vegetables the best sources of vitamin C, as part of a well balanced diet.

### CONCLUSION

Minimizing the consumption of salt-cured, pickled, and smoked foods does not mean the complete elimination of these foods from our diet. Nor does it mean all the meats we choose to eat should be processed. It does mean we can enjoy processed meats in moderation as part of a well-balanced diet. It's more important to ensure you have met your daily requirement for vitamin C by eating fruits and vegetables than to worry about minute amounts of nitrites being consumed.

# WATER - ALSO A NUTRIENT (PART 1)

An unlimited supply of good quality water is essential for swine production. We often talk about protein, energy, vitamins, minerals and assume that the water is taken care of. Water is important, animals will live 10 times longer without food than without water.

## WATER QUALITY

Salts, minerals, toxic substances and bacteria content all have an affect on water quality.

(1) A high level of total dissolved solids (TDS) can create problems.

- up to 7000 ppm dissolved solids is acceptable for growers, finishers and dry sows.
- early weaned pigs have been tested with water high in sulphates or chlorides (6000 ppm TDS) with satisfactory results.
- lactating sows were evaluated at 5000 ppm TDS with no decrease in performance of the sow or piglets.
- if your TDS is high your feed salt level should be adjusted accordingly.

(2) Certain elements are toxic in small quantities. Table 1 gives safe upper limits for some potentially toxic substances.

Table 1. Recommended Limits of Concentration of Some Potentially Toxic Substances in Drinking For Swine.

| Substance | Safe Upper Limit of Concentration (ppm) |
|---|---|
| Arsenic | 0.2 |
| Cadmium | 0.05 |
| Chromium | 1.0 |
| Cobalt | 1.0 |
| Copper | 0.5 |
| Fluoride | 2.0 |
| Lead | 0.1 |
| Mercury | 0.01 |
| Nickel | 1.0 |
| Nitrate - N | 100 |
| Nitrite - N | 10 |
| Salinity (total dissolved salts) | 7000 |
| Vanadium | 0.1 |
| Zinc | 25.0 |

(3) Disease has occasionally caused large losses when the organism was present in the water supply. But these are isolated instances. Even with high bacterial levels pathogenic organisms are rarely present. Chlorination can be very useful in reducing the level of bacteria. The real benefit of chlorination is improved flow rate because of reduced iron bacteria, slime and algae.

## CONCLUSION

Generally water quality is not a problem on most farms.

It's still wise to get your water checked. All district offices of Alberta Agriculture have water bottles which can be filled and sent away for analysis.

There are also a number of publications available on shock chlorination, dugout treatment and other water related problems.

# GETTING A GRIP ON RODENTS

Estimates have stated that nine out of ten hog operations are infested with rodents. Although in Alberta rats are virtually non-existent, mice cost producers hundreds of dollars each year in damaged buildings and contaminated feed. Mice eat hog feed, but contaminate as much as 10 times more. Heating and insulation costs escalate as ceiling and wall insulation is removed or destroyed. Rodents can also carry diseases like salmonella, leptospirosis, swine dysentry and pasteurellosis. Not seeing them doesn't mean they're not there. If left unchecked, they'll continue to cost you because they multiply so fast.

## FORMIDABLE ODDS

Mice reach sexual maturity at 6 weeks, gestate only 16 to 18 days and produce 5 to 8 young per litter. With sheltered nesting sites and a good food supply they can produce a population explosion in any swine barn in short order.

Like most rodents mice have front teeth which are harder than mild steel and are able to gnaw through soft concrete and aluminum siding. Mice can climb outside or inside pipes; up wooden poles or walls; walk along horizontal wires, pipes or conduits; and can flatten their bodies and crawl through a 6 mm (¼ in.) crack but not a 6 mm hole.

## REDUCING THE PROBLEM

1. Snap traps are most economical for attacking small populations of mice. Multiple-catch traps are better for larger populations. Glueboards can be used but their effectiveness is reduced by dust and moisture.
2. Rodenticides are economical for a year-round control problem or large infestations. Non-anticoagulant or anticoagulant (cause of uncontrolled internal bleeding) rodenticides are available in several forms (meal, pellets, liquid, paraffin blocks) as single-dose or multiple-dose baits.
3. Ultrasonic devices have been shown to be largely ineffective.

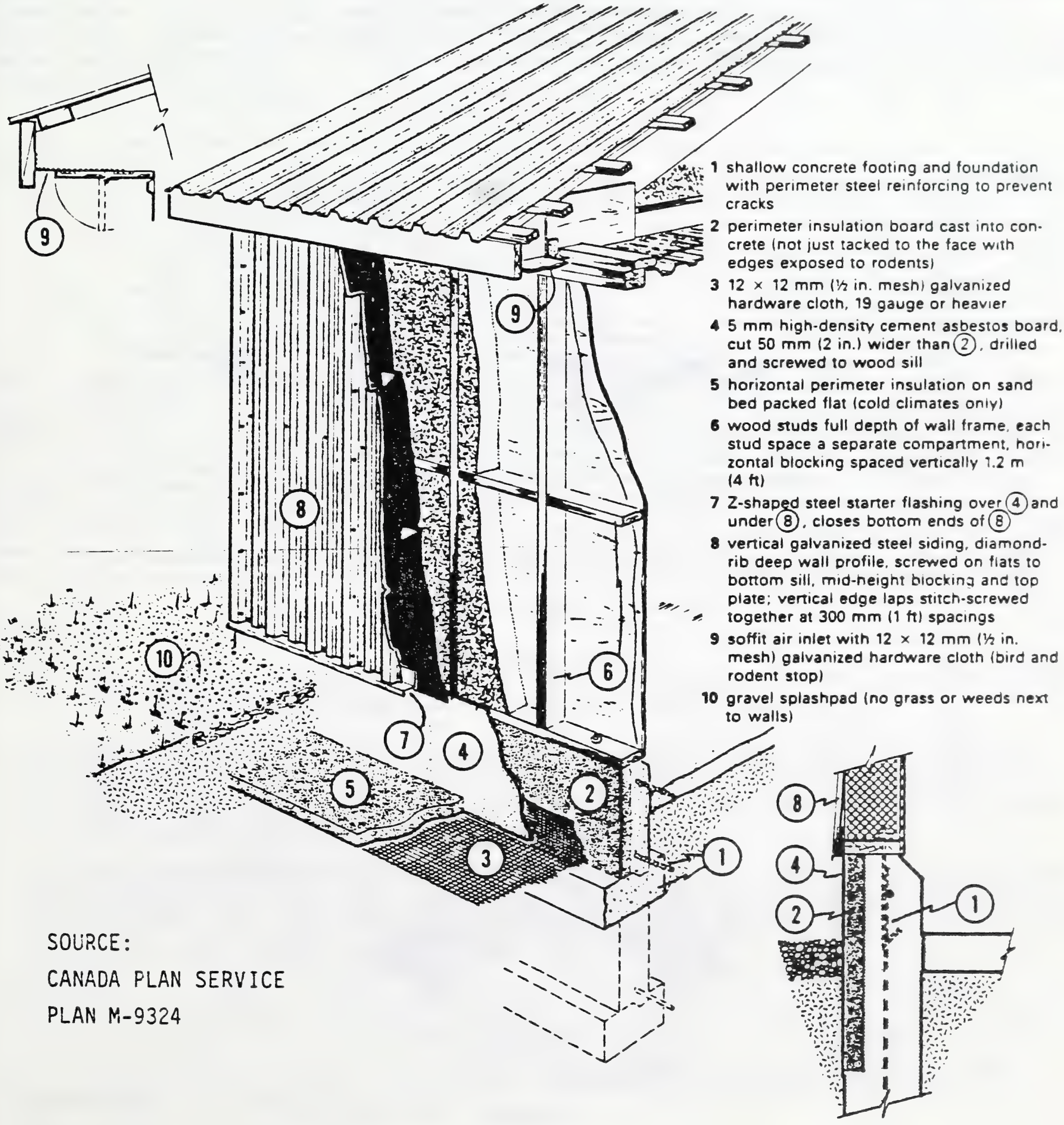
## RODENT PROOFING PROGRAM

A good rodent control program ensures the following steps are taken:

- Good sanitation practices speed up control. Miminimize the rodent's ability to find food, water and shelter. Use feeders that fit flush to the ground. Keep feed stored in separate rodent-proofed or metal buildings.
- Reduce feed wastage and water spillage. Mice can go without water for several days.
- Keep outsides of barns clean of junk and grass or weeds. Put a gravel border 2 ft. wide and 1/2 ft. deep around the building. Fill or smash ends shut on corrugated sheet metal.
- Inspect facilities at night when rodents are active. Check for tracks, droppings, nests, gnawing marks, climbing noises or a persistent musky odor.
- Seal all openings 1/4" or larger. Cover necessary ventilation holes with screen or hardware cloth.
- Establish permanent bait and trap stations. Set traps close to walls or in dark corners. Leave baited, but unset until you notice the bait is being taken. Protect bait and rodenticides from spoilage. Switch brands periodically.

# RODENT- AND BIRD-PROOFED BUILDINGS

Mice, rats and birds eat and contaminate feed and destroy buildings and property. It is always better to build new buildings rodent- and bird-proof in the first place than it is to add screens, flashing and other barriers after the pests have moved in. The diagram below shows construction details designed to minimize rodent and bird problems in new barns. Many of these ideas can also be used in retrofitting existing buildings. Minor changes are required when steel siding is placed horizontally. For detailed information contact your Agricultural Engineer.

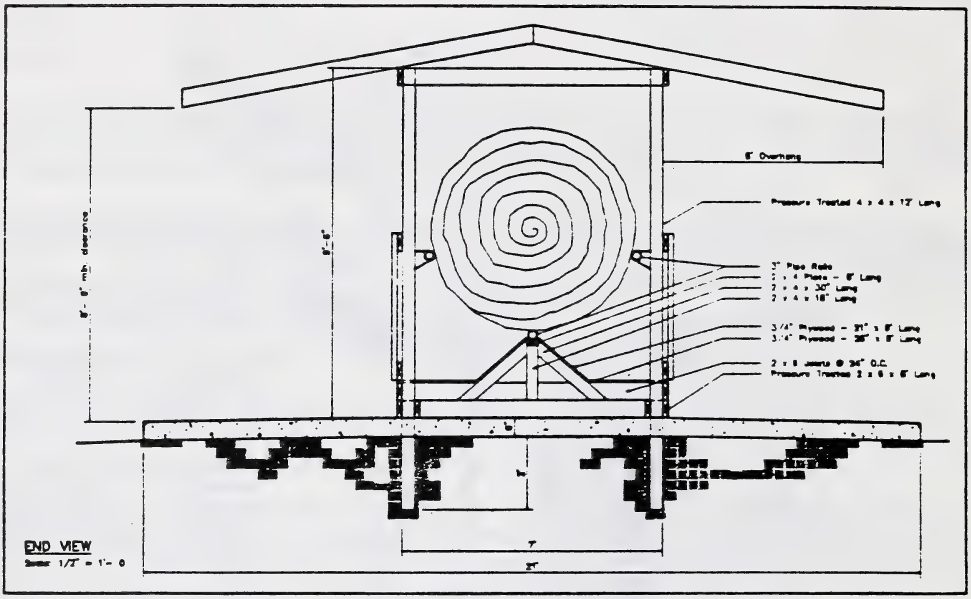


1. shallow concrete footing and foundation with perimeter steel reinforcing to prevent cracks
2. perimeter insulation board cast into concrete (not just tacked to the face with edges exposed to rodents)
3. 12 × 12 mm (½ in. mesh) galvanized hardware cloth, 19 gauge or heavier
4. 5 mm high-density cement asbestos board, cut 50 mm (2 in.) wider than ②, drilled and screwed to wood sill
5. horizontal perimeter insulation on sand bed packed flat (cold climates only)
6. wood studs full depth of wall frame, each stud space a separate compartment, horizontal blocking spaced vertically 1.2 m (4 ft)
7. Z-shaped steel starter flashing over ④ and under ⑧, closes bottom ends of ⑧
8. vertical galvanized steel siding, diamond-rib deep wall profile, screwed on flats to bottom sill, mid-height blocking and top plate; vertical edge laps stitch-screwed together at 300 mm (1 ft) spacings
9. soffit air inlet with 12 × 12 mm (½ in. mesh) galvanized hardware cloth (bird and rodent stop)
10. gravel splashpad (no grass or weeds next to walls)

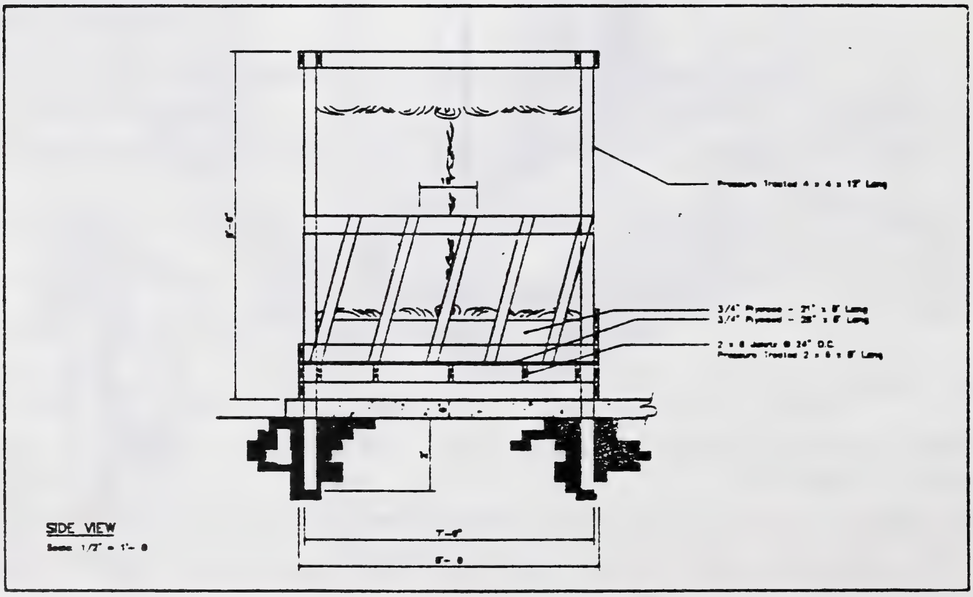
SOURCE:
CANADA PLAN SERVICE
PLAN M-9324

# ROUND BALE FEEDER

This round bale feeder is unique in that if built along a fenceline, it can be filled without opening and closing pen gates. The feeder is filled by pushing the bales into the feeder from one end. Depending upon the length of the feeder built it can hold from 2 to 5 bales. It can be built in segments of 8'. The bales are supported by two rails along the sides and by a center cone at the bottom. The animals are readily able to clean up the entire bale. Wastage can be kept to a minimum by the slant bars on the sides. A roof will prevent buildup of snow and moisture and further reduce wastage.


6' Overhang
Pressure Treated 4 x 4 x 12' Long
3" Pipe Rails
2 x 4 Plate – 8' Long
2 x 4 x 30" Long
2 x 4 x 18" Long
3/4" Plywood – 31" x 8' Long
3/4" Plywood – 28" x 8' Long
2 x 8 Joists @ 24" O.C.
Pressure Treated 2 x 6 x 8' Long
8'-6" min clearance
9'-6"
7'
21'

END VIEW
Scale 1/2" = 1'-0


Pressure Treated 4 x 4 x 12' Long
3/4" Plywood – 31" x 8' Long
3/4" Plywood – 28" x 8' Long
2 x 8 Joists @ 24" O.C.
Pressure Treated 2 x 6 x 8' Long
9'-6"
18"
7'-6"
8'-0

SIDE VIEW
Scale 1/2" = 1'-0

(adapted from Peter Kuelken, Ft. Assiniboine)

# PREGNANCY RATE OF BEEF HEIFERS

We want replacement heifers to breed early in their first breeding season and in subsequent years to continue to rebreed within the first 60 days of the season. The high input cost of raising a replacement and the extended time til we receive a payback from our efforts necessitates that these selected heifers perform. A common recommendation has been to select and breed 30% more heifers than are required. The extra 30% is offset by those heifers which do not settle.

Recent research from Montana reinforces that recommendation. Byerley and his co-workers conducted a study to assess the pregnancy rate of heifers if bred by fertile bulls on either their first or third estrus. The heifers were all crossbred of either Angus, Brown Swiss, Hereford, Brahman, Charolais, Shorthorn, Jersey or Simmental. The following table illustrates their results:

| Estrus Bred At | # | Age At Puberty (Days) | Age At Breeding (Days) | Weight At Breeding (lbs) | Pregnancy Rate (%) |
|---|---|---|---|---|---|
| First | 63 | 322 | 322 | 649 | 57 |
| Third | 45 | 339 | 375 | 717 | 78 |

Age at puberty is defined as the first estrus when the heifer is able to support a fetus (ie. be pregnant). In this study, about 25% of the heifers displayed something called non puberal estrus. That is, they stood to be mounted but did not ovulate and/or form a functional corpus luteum. When exposed to fertile bulls these heifers could not conceive at this estrus. These heifers were not included in the above table. Thus the table results reflect a true pregnancy rate. The table shows a 21% lower pregnancy rate for first estrus heifers than those bred on their third estrus. Researchers state that the lower pregnancy rate may have been due to embryonic mortality. Further, sub-optional fertility with breeding at first estrus is a general phenomenon in female mammals.

## In Practice

1. Heifers should be cycling before the start of the breeding season. Hopefully heifers will have had at least 2 heat cycles before the start of breeding.

2. The average age at the third estrus was 375 days in this experiment. To optimize reproductive efficiency, replacement heifers should meet a minimum age criteria. If the breeding season starts May 18, then all potential replacements should have been born by May 8 of the previous year.

3. If the heifer calves birthdate is unknown then selecting replacements at weaning from the largest heifers that meet your conformation standards is a suitable alternative. These heifers will likely be the oldest heifers and as such will likely cycle at least twice before the start of breeding the following spring.

(Journal of Animal Science, 65:645)

# SUPPLEMENTING SELENIUM

Selenium is a trace mineral required by beef cattle but generally deficient throughout Alberta. Deficiencies of selenium result in lower reproductive rates, lower rates of gain, increased health problems and occasional death losses. White muscle disease and retained afterbirth are two common disorders when selenium is in short supply.

The selenium requirement has been recently increased to 2 mg daily. In certain circumstances, veterinarians and nutritionists will recommend 3 to 4 mg daily. The upper limit of which selenium can be toxic is 20 mg per head per day.

There are four common methods of supplementing selenium. They are: 1) inject 2) use trace mineral or fortified salts (25 ppm) 3) use range mineral (10 ppm) or 4) use triple strength vitamin ADE products (1.05 mg of selenium per 30,000 IU of vitamin A). Livestock producers will often feed more than one of these products at any one time. This raises the question "Is it safe to feed a combination of these products together?".

To answer this question we must consider not only the animals requirements and upper limits but also the potency of the product and the amount of product consumed daily. Remember that the amount of product consumed daily relates to accessibility and palatability of that product. The following table shows the level of supplemental selenium given the range in intakes.

| SOURCE | INTAKE | SELENIUM SUPPLIED |
|---|---|---|
| Salt | 30 - 60g | 0.75 to 1.5 mg |
| Mineral (non prescription) | 20 - 40g | 0.2 to 0.4 mg |
| Triple Strength ADE | 2g | 2.1 mg |
| Injection | (sufficent for 45-60 days) | ? |
| Total Selenium Supplied at Upper Intake Level | | 4.0-5.0 mg |

30g = 1 oz
g - grams
mg - milligrams (1/1000 of a gram)

As seen from the above figures, an animal receiving selenium from all of the above sources will consume about 4 mg per day. This is well below the toxic 20 mg level but double the suggested requirement. We do not need to supplement selenium from all sources. The triple strength vitamin ADE product by itself will meet daily requirements. Depending on intake, the trace mineral or fortified salt may also meet daily requirements by itself.

## CAUTION

1. The high potency of the triple strength product means that only a very small amount is required daily. For example, each cow requires about 0.004 lbs of product daily. Given what mixing facilities exist on farms, it is virtually impossible to mix this small level uniformly. Mixing with salt may be the most acceptable method to deliver this product. Exercise caution when measuring this product. One acceptable method is to have a container (ie. a cup or tin) which is marked to the exact amount.

2. The triple strength product with selenium must be fed frequently (every 2 or 3 days maximum) while the 8 to 10 million IU/kg products (no selenium) can be fed every 2 to 3 weeks.

3. The safest method to supplement selenium is to have your feed company add extra amounts of selenium to the trace mineral or fortified salt. For example, if salt intake is 40 grams daily (1.5 oz) then the salt should contain 50 ppm of selenium to provide the 2 mg daily requirement. The vitamins could then be fed by using the 8 or 10 million IU (International Unit) products.

BEEF 'N' BACON

Alberta
AGRICULTURE

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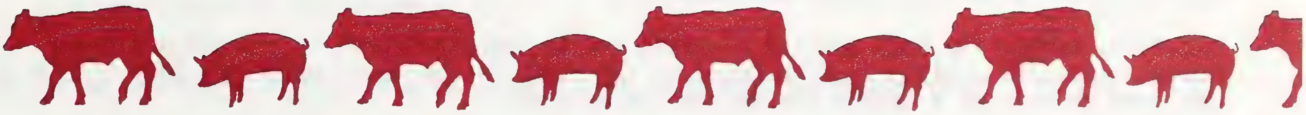

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# RED MEATS

## THE IMPORTANCE OF PROTEIN

Every cell in the human body contains proteins. Indeed, proteins are the primary, basic components of life. Foods from the milk group and the meat group are the 2 major sources of protein in our diets.

### WHAT IS PROTEIN USED FOR?

Proteins are needed for a variety of functions. The proteins in our bones, are part of the carpentry that keeps us erect. Proteins known as enzymes act as chemical engineers putting substances together or taking others apart. While proteins called antibodies protect us from disease as part of our immune system.

### AMINO ACIDS

Proteins are made up of sub-units called amino acids. There are 20 different amino acids. Nine of these amino acids can not be made by our bodies and must be present in our diet in the right amounts. These 9 are known as the essential amino acids.

### PROTEIN FOODS

Low nutritional value protein foods usually have one or more of the essential amino acids in short supply. Foods of plant origin usually fall into this category eg. breads, pasta, breakfast cereals, legumes, and nuts. Combining these foods (eg. peanut butter and bread) can improve their protein quality.

For high nutritional value, proteins should contain all 9 essential amino acids in the amounts needed by our bodies, plus a generous quantity of nonessential amino acids. Protein from animals sources fits this description. Pork and beef along with milk, eggs, poultry and fish are all excellent choices.

Proteins, especially high quality proteins are an important part of our daily dietary needs. The high quality protein found in red meats is one good reason why they should be included as part of a varied and well-balanced diet.

# DON'T LET YOUR STUD BECOME A DUD

How a new boar is initially handled has a lot to do with his future productivity. There are a number of things you should and should not do with newly purchased boars.

- Purchase new boars at least six weeks before expected use. Do not expect a new boar to work immediately upon arrival at your farm. This allows him to develop immunity to the bugs on your farm and give him some more growing time.
- Purchase boars from farms with the same or better health status than your farm. Find one good supplier and stick to him. Do not jump from supplier to supplier. It only takes one boar to bring in a new disease.
- Buy high indexing boars that will improve your herds growth rate and reduce backfat. With Estimated Breeding Values (EBV's) you can be more confident that the boar will improve growth and reduce backfat.
- Isolate new boars for 3-4 weeks away from the rest of the herd. Then get a veterinarian to check the boar out both visually and by blood sample.
- After the blood sample is taken vaccinate the new boar for parvovirus, and erysipelas, also deworm and treat for mange. Ask your veterinarian about other vaccines that should be used.
- Make sure the boar has strong legs, has good confirmation and walks well. Most boars will spend their productive life on a hard concrete floor.
- Never put a new boar into a pen of older sows. If he gets beaten up this could affect his breeding ability or lack of it. Try him on a young sow that is in a good standing heat and supervise the breeding. Bring the sow to the boar pen. If he mounts on the front gently remove him before his penis gets bitten. It he side mounts gently turn him to the right end.
- Use a new boar sparingly the first 6 weeks. Double mate with another boar the first while because the young boars semen might not be up to par.
- Carefully watch a boars first service. Make sure the penis enters the vulva correctly. Watch carefully for anal services and for a limp, small or a tied penis. If the first service goes well the boar will likely perform well.
- Boars should be at least seven months old before using in the breeding herd. Age is more important than size. A large boar may not be sexually mature.
- A boar that is used to produce gilts should have at least 14 evenly spaced teats.
- Boars respond to gentleness. Hot shots, whips, prods or canes should never be used in loading, unloading or moving boars. Spend time talking to your boars.
- Feed boars 5 - 6.5 lbs of a 14% Dry Sow ration per day. This will depend on size, use and environmental conditions.

Treating new boars correctly will increase his chance of a productive life on your farm.

# THE QUESTION OF CLIPPING TEETH

In Canada, clipping piglet canine and incisor teeth is a routine practice at farrowing or within the first few days of it. Piglets are born with eight sharp needle teeth -- four located in the upper and four in the lower jar. Although these temporary canine and incisor teeth are eventually replaced with permanent ones at nine months of age they can pose problems on many farms if left unchecked. Clipping teeth is a management tool that must be evaluated under each situation.

## WEIGHING THE PROS AND CONS

During the first few days of life the piglets fight with each other at the udder in establishing a "teat order". In doing so, sharp canine teeth can severely damage the sow's udder plus other pigs in the litter.

Teeth clipping at birth helps to reduce:

- sow discomfort that can inhibit milk release, increase crushing and savaging losses, and increase the potential for mastitis problems.
- damage to piglet faces that can result in infections.

Incorrect cutting methods can cause injury to the tongue and mouth. The mouth is a good source of bacteria which can result in infections from open wounds. Equipment must always be thoroughly cleaned and disinfected. The use of improper equipment can cause the teeth to break off leaving sharp corners behind. This again can result in injury to the mouth and potential infections.

Results of recent European research has shown that:

- incorrect cutting causing infections results in lower piglet growth rates.
- cutting has no influence on piglet mortality rates.
- not cutting results in more damage to piglets' heads.
- when cutting was not done, 2% of sows refused to let piglets suckle. After clipping teeth, suckling was allowed.
- for experienced stockmen, teeth clipping took about 20 seconds per piglet.

## WHEN TO CLIP

Careful consideration must be given to teeth clipping. Cutting of teeth as a routine practice is not always necessary. Cutting should be considered:

1. When the sow refuses to let the piglets suckle.

2. When piglets are seriously damaging each other by fighting.

## THE RIGHT PROCEDURE

The following points must be followed:

1. Use clean, proper equipment. Use a pliers that opens automatically by a spring. Clean and disinfect after each use.

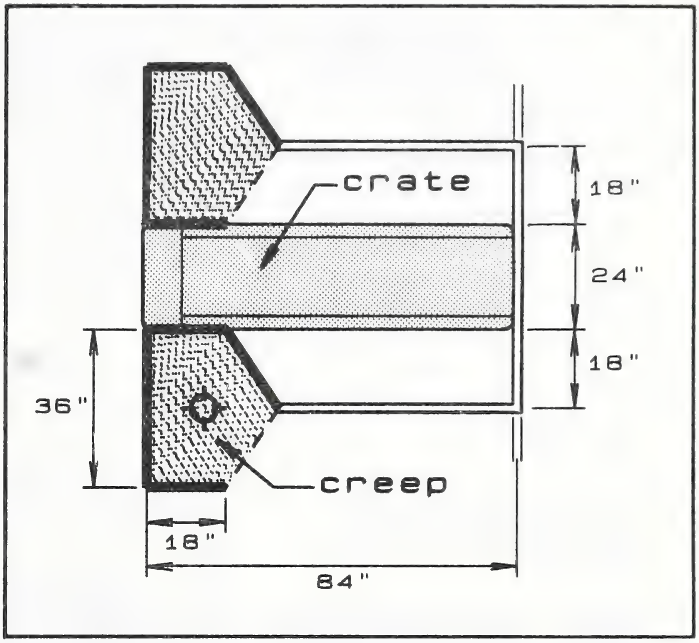
2. Use the right procedure. Hold the pig with the fore-finger and thumb around the neck. The fore-finger can then be placed in the corner of the mouth. Remove only the points of the teeth. Do not cut too close to the gums.

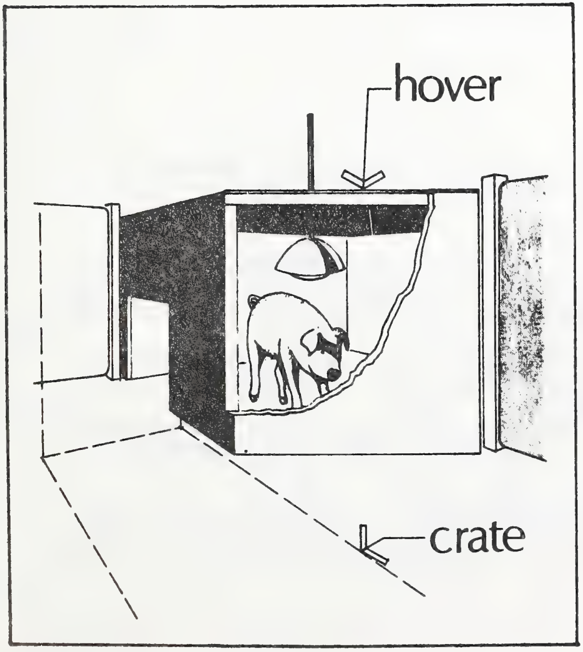
(adapted from: PIGS/87)

## TRIANGULAR CREEP

A new style of creep that is gaining popularity is a triangular or corner creep (see diagram at right). This type of creep is a compromise between the front and side creep styles.

The triangular creep offers an advantage in renovations where existing side creeps are too small or too narrow. This creep allows piglets to rest away from the danger zones near the sow.





The triangular creep area can be modified to an enclosed, covered area known as a hover. Hovers provide a warm comfortable environment at a low energy requirement. They should be constructed with solid floors, roofs and sides. A fourth side can be equipped with a small pop-hole (8" X 10") or clear plastic door strips (see example diagram at left).

Low wattage light bulbs or heat lamps on a dimmer switch permit strict control of the hover environment. Recommended height for creep sides is about 24 inches.

# NEWBORN CALF SLED

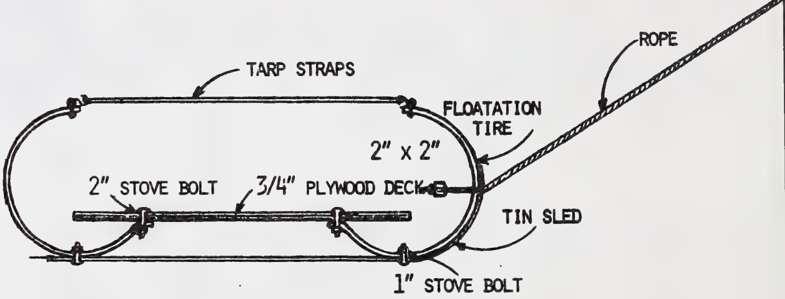
Cattlemen are often faced with the problem of moving a cow and her newborn calf to a claiming area, closer to shelter and bedding or into a separate pen. Cows can be very possessive of their newborn calf and injuries can happen when an individual gets between a newborn calf and an over anxious mother.

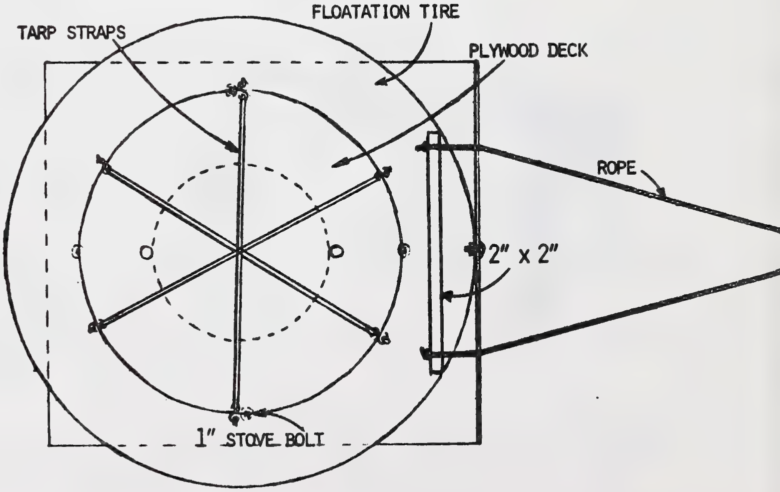
Here is a calf sled which can be made with existing material in a very few hours. The meta bottom should be a smooth metal, ie. not corrugated. The sled should follow the easiest path and not up and over the frozen piles.

The calf is placed in the sled in the following manner:

a) put rear end in first
b) wrap calf into the curve of the tire
c) secure calf by hooking up tarp straps
d) four tarp straps may be required for large calves.

1. Cut the top out of a large floatation type implement tire (e.g. baler)
2. Cut a round piece of 3/4" plywood to fit down into tire; bolt in place with at least 2, 2" long stove bolts.
3. Bolt tire to appropriate sized sheet of heavy gauge metal using at least 4, 1" long stove bolts; curve the leading edge up onto the tire and bolt (corners can be rounded)
4. Thread a length of 1/2" nylon rope through the metal, tire and a length of 2" x 2" inside the tire
5. Install 6 eyelets in top side of tire to hook tarp straps into once calf is placed inside the tire


ROPE
TARP STRAPS
FLOATATION TIRE
2" x 2"
2" STOVE BOLT
3/4" PLYWOOD DECK
TIN SLED
1" STOVE BOLT


TARP STRAPS
FLOATATION TIRE
PLYWOOD DECK
ROPE
2" x 2"
1" STOVE BOLT

(Adapted from
Rose & Garth Bibby,
Westlock)

# BREED SELECTION

Canada Agriculture has recently evaluated the profitability of 10 types of first cross cows, four terminal sires and 31 crosses of three-breed cross calves. The research was started in the seventies at Manyberries, Alberta and Brandon, Manitoba Research Stations. The researchers related production traits such as birth weight, calving difficulty, weaning weight, calf dealth loss, cow longevity, cow size and feed requirements to a total combined economic value. There were performance records on 572 cows, 2006 live births and 1930 weaned calves plus 1555 cow years of winter and summer feed requirements.

One portion of their economic evaluation was to assess which terminal sire best suited a particular crossbred cow. The Hereford and Angus breeds were not a part of this sire evaluation since they are considered maternal rather than terminal breeds. Based on the above production traits, the sire was ranked for profitability. If income differences were far apart (ie. greater than $10/cow), the more profitable sire was indicated as having greater returns (>) than the next best.

RANKING OF SIRE FOR DIFFERENT CROSSBRED COWS

| Crossbred Cow | Terminal Sire Ranking |
|---|---|
| Hereford/Angus | C = S = L > Chi |
| Charolais/Hereford | Chi > S = L |
| Charolais/Angus | L = Chi > S |
| Charolais/Shorthorn | L = Chi > S |
| Simmental/Hereford | L > Chi = C |
| Simmental/Angus | C = L > Chi |
| Simmental/Shorthorn | C > L = Chi |
| Limousin/Hereford | C = S > Chi |
| Limousin/Angus | C > S = Chi |
| Limousin/Shorthorn | S > Chi = C |

For example for a Hereford (H)/Angus (A) cows, the Charolais (C), Simmental (S) and Limousin (L) sires had equal (=) returns but were all greater than (>) the Chianina (Chi) sires.

The Limousin and Charolais breed were the best overall terminal sires in this economic evaluation. Limousin sired calves were smaller at weaning but had lower calving difficulty and higher survival.

The Charolais Angus and Simmental Shorthorn cows weaned more calf weight per breeding exposure and had lower calving difficulties than the other breed crosses. They also required more feed than some other crosses. The Hereford Angus cow was intermediate.

A summary of the results are:

(1) The major determinant of profitability is percent of calves weaned and the weaning weight of the calves. Calving difficulty and feed requirements have a small effect on returns.

(2) Reproductive performance should not be sacrificed for heavier weaning weights. Good reproductive performance and weaning a light calf tended to increase income more than poor reproductive performance and weaning a heavy calf.

(3) The performance of the cow is more important than the breed of terminal sire in determining income.

(4) Give consideration to calving ease and survival rather than just growth potential when selecting a terminal sire breed.

(5) The heavier the calf at birth, the greater the likelihood of calving difficulty, calf death and a lengthened after calving anestrus period. A lighter calf at birth may be the more profitable alternative.

(Adapted from Cow-Calf Production Returns in the Parkland Region, 1987)

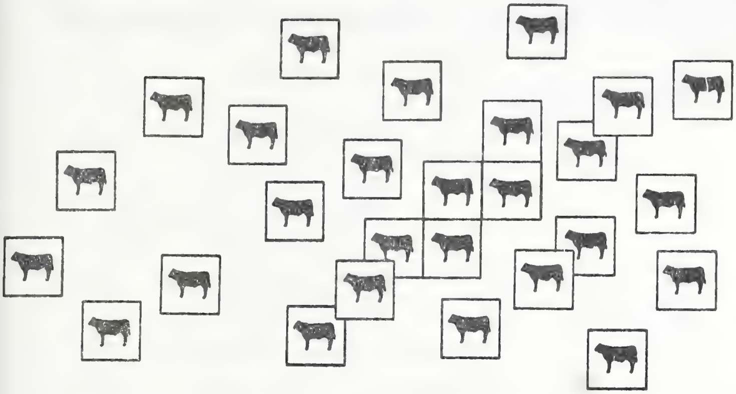
# CALF SCOURS

Calf scours is a concern for all cattlemen. It has been estimated that the scours complex costs the Canadian beef industry $8.70 per calf born. In Alberta alone, this represents $11 million. A scours outbreak is difficult to predict and difficult to protect against, but through good management practices, some of the risks can be reduced or eliminated. Here is a list outlining high or low risk practices.

| | RISK OF SCOURS | |
|---|---|---|
| | LOW RISK | HIGH RISK |
| Age of Cow | 3 years & up | 2 years old |
| Calving Difficulty | unassisted | prolonged delivery or hard pull |
| When heifers calve | 2 year olds calve before cows or separate from cows | 2 year olds calve with cows |
| When calf received colostrum | first 6 hours | 6 hours from birth |
| Calving location | outside, spacious areas with calf shelters & wind breaks | confined in wintering area or rotating each cow through the barn to calve |
| Calf shelter | well bedded, high front so sun reaches back and deep for wind protection | no shelter |
| Ground condition | snow removed to dry soil and exposed to sun | wet, poor drainage areas |
| Bedding | abundant, dry | wet and contaminated |
| Cows udder | clean, free of manure | wet, manure contaminated |
| Calving Pen Space | 2000 sq. ft. per heifer | 2000 sq. ft. per heifer |
| Calving groups | 20 to 40 head | 40 head in same pen |
| Minerals & Vitamins fed | adequate selenium copper & vitamin ADE | blue or red salt |
| Condition of Cow | moderate, condition score 2.5 to 3 | thin, condition score 2 or less |
| Calf treatment | isolate sick and treat early | treat without removing from herd |

Consult your veterinarian if scours are a problem in your herd. Veterinarians can suggest a management routine to reduce the incidence of scours and prescribe treatments if an outbreak occurs.

# BEEF HERD MANAGEMENT REFERENCE BINDER AND STUDY GUIDE NOW AVAILABLE



Alberta Agriculture has just released a comprehensive and up-to-date collection of material on beef herd management. The Beef Herd Management Reference Binder and Study Guide is a valuable reference for cow-calf producers and extension personnel.

Information in the binder is drawn from across western Canada and some portions of the United States. The binder contains over 175 factsheets on every aspect of managing the beef herd.

Three key sections in the binder make those 175 factsheets easy to access. The Management Guide takes the producer through the critical stages of the biological cycle of the cow. For each stage, the management guide outlines herd management objectives, gives points to remember, recommends good management practices and makes suggestions for planning ahead. In each instance, reference is made to factsheets which supply more detailed information.

The second key section is a Troubleshooting Guide which helps the producer pinpoint herd problems. The third key section is a study guide which through a series of questions and answers works through the production cycle of the beef herd.

The cost of the binder is $35.00. Registration forms are available from Alberta Agriculture district offices or through the Home Study office in Edmonton at 427-2404.

## BEEF HERD MANAGEMENT

Reference Binder and Study Guide

**REGISTRATION FORM**
(PLEASE PRINT)

**NAME** ____________________

**ADDRESS** ____________________

**POSTAL CODE** ____________________

**PHONE** ____________________

**SIGNATURE** ____________________

**FEE $35.00**
Fee in full must accompany registration

Rural Education and Development Association

Remit $35.00 by cheque or money order payable to REDA, 14815-119th Avenue, Edmonton, Alberta, T5L 2N9

# ALBERTA BEEF SYMPOSIUM

## "LIVE CATTLE MARKETING - OPTIONS FOR THE FUTURE"

February 2 & 3, 1988
Coast Terrace Inn
4400 Calgary Trail
Edmonton, Alberta

**The Program:**

**Tuesday, February 2, 1988**

| | |
|---|---|
| 11:00 a.m. | Registration Opens |
| 12:00 noon | Complimentary Lunch |
| 1:00 p.m. | Opening Remarks<br>Charlie Gracey,<br>Canadian Cattlemen's Association |
| | **Opening Session** |
| 1:30 p.m. | Beef or Cattle - What are we Marketing?<br>Mick Price and Murray Hawkins<br>University of Alberta |
| 2:30 p.m. | Coffee and refreshments |
| 3:00 p.m. | Panel:<br>Rob Mitchell,<br>Consumer Demand and Perceptions<br>Al Rogerson - Packing Plant<br>Ed Thiesen - Feedlot |
| 5:30 p.m. | Cash Bar |
| 6:30 p.m. | Symposium Banquet |

**Wednesday, February 3, 1988**

| | |
|---|---|
| 7:00 a.m. | Breakfast |
| | **Present Marketing Systems** |
| 8:30 a.m. | Keynote Speaker - Jim Wideman |
| 10:00 a.m. | Coffee and refreshments |
| 10:15 a.m. | Panel:<br>Brenda Scheideman - Cow Calf Producer<br>Ron Simm - Auction Markets<br>Gary Kelsey - Dealer |
| 12:00 noon | Luncheon<br>Mary Jane Kilpatrick - Olympic Promotion Program |
| | **Marketing Strategies for the Future** |
| 1:15 p.m. | Marketing "Down under"<br>David Wright |
| 2:30 p.m. | Coffee and refreshments |
| 2:45 p.m. | Panel:<br>George Graham - Feedlot Sales<br>Pat McCarthy - Marketing into the U.S.A.<br>Will Irvine - Electronic Marketing |
| 4:00 p.m. | Wrap Up - Charles Gracey |
| 4:30 p.m. | Coffee (for the road) |

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## REGISTRATION FORM

Alberta Beef Symposium
February 2 & 3, 1988

Please accept my registration for the Alberta Beef Symposium

| | First Name | Last Name | Before Jan. 1, 1988 | After Jan. 1, 1988 |
|---|---|---|---|---|
| Primary Registrant: | ____________ | ____________ | ______ ($70.00) | ______ ($90.00) |
| Spouse | ____________ | ____________ | ______ ($55.00) | ______ ($75.00) |

Address ______________________________ $ ____________________
Total Registration Fee

______________________________

______________________________
(Postal Code) (Telephone)

Make cheque or money order payable to: Alberta Cattle Commission-Beef Symposium
Detach and mail to the following address:

The Alberta Beef Symposium
Alberta Cattle Commission
#241, 2116 - 27th Avenue, N.E.
Calgary, Alberta
T2E 7A6
Phone: (403) 291-4800

AL.1.811

# BEEF 'N' BACON

Alberta
AGRICULTURE

FEBRUARY 1988 Vol. 3, No. 5

CANADIANA
FEB 24 1988

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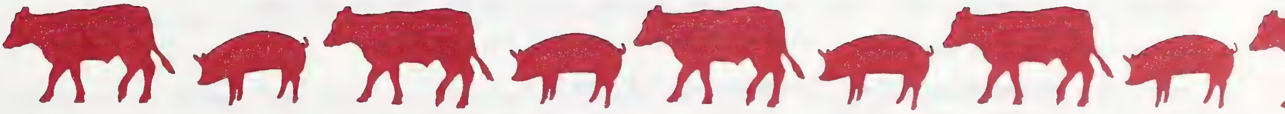


## INTRODUCTION

Beef'n'Bacon was initiated in the fall of 1985 as a winter livestock program for the North West Region of Alberta. In 1987 it was expanded to include the North Central Region. The newsletter's objective is to reach livestock producers with timely and pertinent topics. It is not our intention to explain the subject matter in elaborate detail. Instead, we hope to spark your interest.

Issues of Beef'n'Bacon are distributed to approximately 4300 livestock producers and agri-businesses in Alberta. It is written and edited from the Barrhead and Red Deer Regional Offices. District Comments (optional) are added by the District Agriculturist.

More information on all articles is available by contacting your District Agriculture Office or:

Barrhead Regional Office
Rob Hand, Livestock Specialist
Bert Dening, Swine Specialist
Wayne Winchell, Agricultural Engineer
Diane Bourne, Food and Nutrition Specialist
674-8248 or 134-1248 (RITE)

Red Deer Regional Office
Marvin Salomons, Swine Specialist
Dale Zobell, Livestock Specialist
Robert Borg, Agricultural Engineer

340-5336 or 151-5336 (RITE)

# RED MEATS

## RED MEATS & CANADA'S FOOD GUIDE

Do red meats fit into the nutritional guidelines being promoted in Canada? That is Canada's Food Guide, along with 3 basic concepts-variety in food choices; moderate use of fat, sugar, salt, and alcohol; and balance between energy in and energy out.

### VARIETY

No one food provides all our body's nutrient needs. For example, pork is richer in thiamin ($B_1$) than other red meats, however beef is a better source of niacin ($B_3$). We need to choose a variety of foods within each of the four food groups of Canada's Food Guide. The correct number of servings and portion sizes are important.

### MODERATION

"Moderation" means cutting down, not cutting out. Recent evidence suggests most Canadians eat modest meat portions and most of the beef and pork consumed is lean. For these people, red meats do not contribute an excessive amount of fat to the diet.

### ENERGY BALANCE

To prevent obesity, we need to choose nutrient-dense foods. That is foods which provide high amounts of nutrients for a low number of calories. Lean beef and pork are excellent examples of nutrient-dense foods. This means beef and pork prepared and served without adding extra fat and in the serving sizes suggested by Canada's Food Guide.

Lean cooking is the key to controlling fat in our diets. Here are a few suggestions:

- broil, roast, or braise your meat instead of frying or deep fat frying.
- make gravy without fat, use only the liquid portion of the drippings.
- trim visible fat on meat.
- add less fat when cooking. Use non-stick pans.

# 10% PREWEANING MORTALITY, POSSIBLE!!

Surveys indicate that average preweaning mortality is around 25%, as it has been for the last 20 years. Only by farming for the least privileged pig is a preweaning mortality of less than 10% possible.

The following considerations will help reduce preweaning mortality.

## THE FARROWING AREA

- provide a clean, dry and warm area for farrowing with no drafts.
- position heat lamps behind the sow, remember a piglet is going from a hot 99 degress F womb into a 65-75 degrees environment.
- keep the light subdued and reduce activity, a radio helps.

## THE SOW

- move into farrowing area 4 days before farrowing.
- check the udder for hardness, watch for constipation.
- check vaccinations, health, production and her history.
- feed a proper diet during gestation and lactation.
- check the age spread of your sows, keep an even parity spread.

## FARROWING

- supervised farrowing can save 1/2 to 1 pig in every litter.
- dry off piglets at birth, teach them to lie in the creep area.
- learn how and when to interfere, delays of over ½ an hour between piglets could require assistance. Use plastic sleeves, soap and water and be very clean.

## COLOSTRUM

- without colostrum the piglet has no defence against the millions of bacteria that are invading his body. MAKE SURE THEY GET COLOSTRUM.
- assist weak piglets to the teat.
- feed colostrum by syringe (sows are easily milked).
- split suckle (lock some piglets in the creep while other suckle).
- give weakest piglets access to the udder for 3 forty minute periods.

## FOSTERING

- fostering is an art not a science, LEARN THIS ART!!
- even up litter birth weights, group the largest and smallest separate.
- even up the number of piglets per sow.
- match the size of piglets to teat profile.
- usually the largest piglets are moved, this will depend on who has a well established teat or not.
- move piglets within three days of birth.

## WATER

- give piglets access to water for the first 72 hours in a trough or container that they can drink from.

## THE PIGLET

- two important rules - conserve the piglets energy
  - maximize the piglets energy intake

There are a number of other considerations such as crate design, creep design, breed, disease and others that will affect preweaning mortality. But if you farm for the least privileged pig and pay attention to detail a preweaning mortality of less than 10 percent is possible.

# WATER - ALSO A NUTRIENT (PART 2)

Usually the lack of water (not quality) is a bigger deterrent to good hog production. Hogs only drink for a certain period of time each day. Most experts say this time is 20 minutes. This means a hog should meet its' full daily requirements in 20 minutes.

Table 1 gives water consumption amounts for different sizes of pigs. This table does not account for spillage. Make sure the flow rate at your water nipples will meet the hogs needs in 20 minutes.

Hogs often spill 50 to 100% of their daily needs. This means that a grower hog needing 1 gallon of water each day should be given access to 1½ to 2 gallons in 20 minutes.

Table 2 gives the required flow rate assuming one nipple per 10 hogs and free access to water at all times. This table also assumed 100% of the water was wasted and the hogs only drank 20 minutes out of each 24 hours.

Flow rates can easily be checked using a measuring container and a watch. Check the pen furthest from the pressure tank when other pigs are drinking to get a realistic flow rate. Also check the flow rate in the farrowing crate every time a new sow is put in.

Lack of water can lead to poor milk production, mastitis, constipation, poor growth and many other problems.

- check water flow regularly.
- have 1 nipple per 10 pigs.
- have two nipples per pen for safety.
- clean nipples on a regular basis, chlorination will help keep the lines clean.

Table I. Estimated Water Consumption by Pigs At Various Stages of Growth and Physiological Function.

| Size of Pig | Daily Water Consumption litres (Imperial) |
|---|---|
| Nursing Piglet | Adequate to ensure satisfactory creep feed consumption |
| Starter Pigs 5-10 kg<br>(11 - 22 lbs) | 1.3 - 2.5 litres<br>(.28 - .5 gals) |
| Grower Pigs 10-35 kg<br>(22 - 77 lbs) | 2.5 - 3.8 litres<br>(.5 - .81 gals) |
| Finisher Pigs 35-100 kg<br>(77 - 220 lbs) | 3.8 - 7.5 litres<br>(.81 - 1.6 gals) |
| Dry Sows, Gilts & Boars | 13 - 17 litres<br>(2.8 - 3.6 gals) |
| Lactating Sows & Gilts | 18 - 23 litres<br>(3.8 - 4.9 gals) |

(From Manitoba Agriculture, Agdex 440-68)

Table II. Flow Rate Requirements for Different Sizes of Pigs. Assuming 100% Spillage.

| | Maximum Flow Rate |
|---|---|
| Starter Pigs | .23 litres/minute<br>(.8 cups/minute) |
| Grower Pigs | .36 litres/minute<br>(1.28 cups/minute) |
| Finisher Pigs | .7 litres/minute<br>(2.56 cups/minute) |
| Dry Sows, Gilts & Boars | 1.6 litres/minute<br>(.36 gallons/minute) |
| Lactating Sows & Gilts | 2.25 litres/minute<br>(.5 gallons/minute) |

Give your hogs access to all the clean fresh water they can drink. Water is the cheapest nutrient you have on the farm so make sure your stock has enough of it.

# BUILDING A PIG TOY

If your pigs are being overly aggressive, a teeter-totter may be just the toy they need. Animal scientist, Al Schaefer at the Lacombe Research Station has demonstrated that of the toys tested, pigs prefer a teeter-totter. Pigs playing with it on one side attract the attention of pigs in the next pen sharing the teeter-totter.

The teeter-totter can be constructed of 4 to 6 foot-long, one-inch steel tubing, fastened at a pivot point in (see Figure A) or on (see Figure B) the pen partition. Chewable materials such as pieces of belts, hoses, tires can be attached to the ends. Motorcycle tires have been found to get the best mileage.

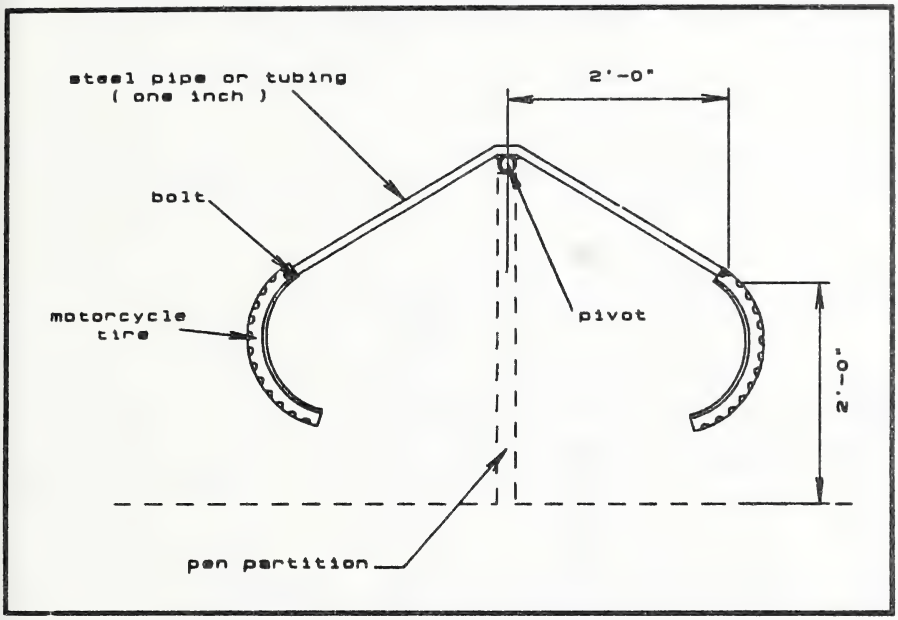

steel pipe or tubing
( one inch )
2'-0"
bolt
pivot
motorcycle tire
2'-0"
pen partition

Figure B   Teeter-totter mounted on pen partition.

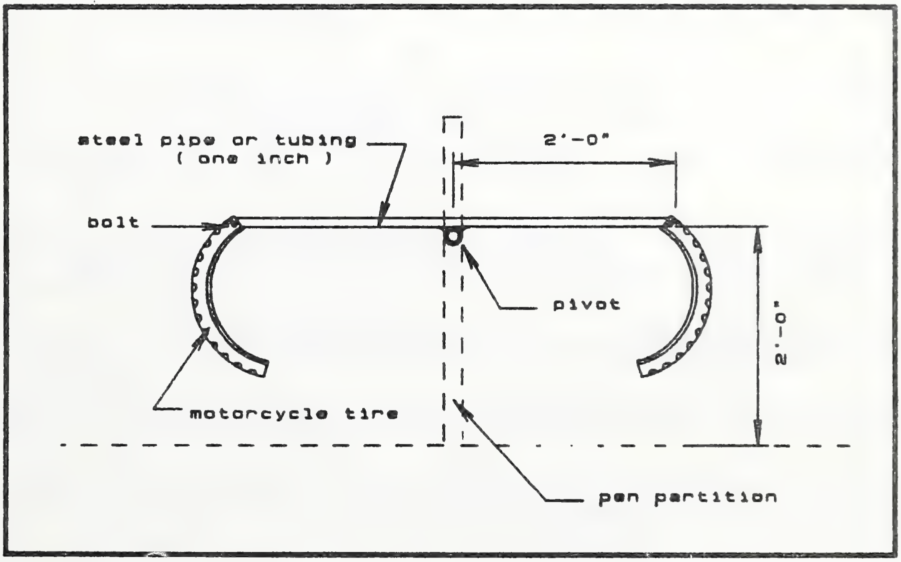

steel pipe or tubing
( one inch )
2'-0"
bolt
pivot
2'-0"
motorcycle tire
pen partition

Figure A   Teeter-totter mounted in pen partition.

# HOOK FOR SAMPLING LARGE ROUND BALES

One of the difficulties when purchasing large round bales is assessing the interior of the bale. The outside 6" of the bale can be inspected by grabbing a sample with your hand. Further inspection of the interior is almost impossible without special tools. Forage probes which take core samples to a depth of 20" are available thru District Agriculture Offices. These probes are good when a chemical feed analysis is planned since they give a representative sample if enough cores are taken. However, when a quick visual inspection is desired the following forage hook for large round bales is useful. It works simply by inserting the hook into the bale, rotating half a turn and withdrawing. The resulting sample may have lost some leaves but can be assessed for quality factors such as:

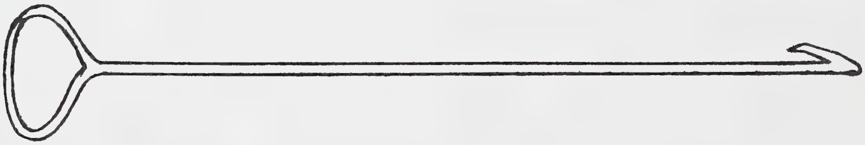
- color
- dustiness
- smell
- ratio of grass to legume
- stage of cut

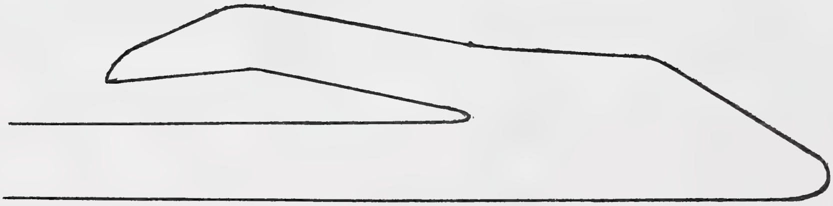
Measurements:

Overall length - 34"

Length (excluding handle) - 28"

Rod size - hook - 3/8" x 3½"
- main shaft - ½" x 48" (allows for curving handle)





Actual Size

(Norman Anderson, Barrhead)

# WHO PAYS THE BILLS?

Since weaning time represents the end of the mother cow's productive cycle, it is a logical time for assessing costs and returns. The table shows the return to fixed cost for cows calving at different times within the calving season. It is based on the assumptions that:

(1) all calves will gain at the same rate ie. 2.35 lb/day regardless of whether born early or late in the calving season.

(2) the calves are weaned on the same date, say October 15. In this example, the first calf was born on March 1.

(3) the price per lb at the given weights is relative ie. buyers pay more per lb for light weight calves than heavier weight calves.

(4) cash costs are $350 per cow. On a per calf weaned basis cash costs per calf will be cash costs per cow divided by the percentage of calves weaned. If weaning rate is 85% of those exposed, then cash costs per calf are $412.

Effect Of Calf Age On Return To Fixed Costs

| Days From 1st Calf | Age At Weaning | Weaning Weight | Price /lb | Gross Return | Return To Fixed Cost |
|---|---|---|---|---|---|
| 1-21 | 217 | 597 | $1.10 | $657 | $245 |
| 22-42 | 196 | 547 | 1.14 | 624 | 212 |
| 43-63 | 175 | 498 | 1.18 | 587 | 176 |
| 64-84 | 154 | 448 | 1.22 | 547 | 135 |
| 85-105 | 133 | 399 | 1.26 | 503 | 91 |
| 106-126 | 112 | 349 | 1.30 | 454 | 42 |

Even with premium prices for light weight calves, the return to fixed costs is substantially higher for calves born early in the calving season. In fact, calves born within the first 63 days of the calving season could average over twice the return to fixed cost as late born calves. In years of poor prices, some late born calves will not cover cash costs, let alone fixed costs of production.

The average calving season in Alberta exceeds 100 days in duration. Efforts to shorten the calving season to 63 days or less will be profitable for most operations. Three possible reasons for an extended calving season are:

- lack of groceries. At the start of breeding season, cows are not in sufficient body condition for high fertility.
- second calf cows experience excessive competition for feed. This is a common problem on many farms.
- calving difficulty either due to choice of bull or body condition of cow.

# ANALYSING COW RECORDS

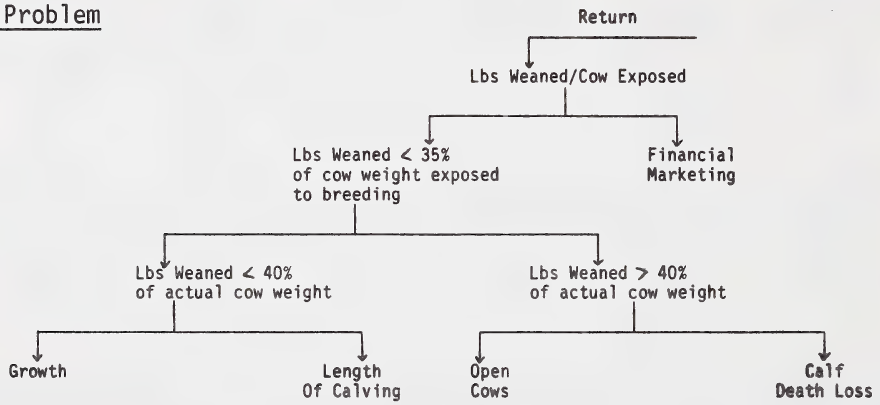
Records should provide a flow of information back to the farm. That information could point to strengths and weaknesses in the operation. It could identify possible causes for a problem and give a most probable solution. It could also provide a benchmark for predicting future productivity.

The absolute minimum production records that should be kept are:

- # cows bred
- # calves born per week
- date of first and last calf born
- # died from birth to weaning
- estimated weaning weight

These 5 pieces of information provide valuable clues when diagnosing a low productivity problem. From this information we could calculate the total lbs of calf weaned per cow exposed to breeding. This calculation is the end result for cow calf operations. It gives an indication of cow and bull fertility, calf growth, length of the calving season and of calf death losses. The following flow chart illustrates how with a few records, a manager can identify causes for low productivity.

Diagnosing A Problem


Return
Lbs Weaned/Cow Exposed
Lbs Weaned < 35% of cow weight exposed to breeding
Financial Marketing
Lbs Weaned < 40% of actual cow weight
Lbs Weaned > 40% of actual cow weight
Growth
Length Of Calving
Open Cows
Calf Death Loss

Lets use an example. A producer wants to increase his return. The producer weans 85 calves with an average weight of 500 lbs from 100 cows. His cows weight 1300 lbs. The calving season is 107 days. This past year there were 7 cows culled for physical problems, 4 open cows and 4 calves died. In this example the LBS WEANED/COW EXPOSED is 500 lbs x .85 or 425 lbs per cow exposed. As a percentage of cow weight exposed it is 425/1300 = 33.0%. Since this figure is below 35%, we should check lbs weaned over acutal cow weight (500/1300 lbs) or 38%.

Since 38% is less than 40% of actual cow weight then either improvements in growth or length of the calving season are required. The calving season is 107 days long. Potential reasons for an extended calving season should be identified and solutions discussed. Calf growth should also be considered. Obviously the flow chart can be broken down further to solve the problem. But the flow chart illustrates how with a minimum of records, weaknesses can be identified. Many producers will want to record more information than the minimum suggested here. The more records kept, the more information available when assessing a problem.

AL.1.811

# BEEF'N' BACON

Alberta
AGRICULTUR

MARCH 1988 VOL. 3, NO. 6

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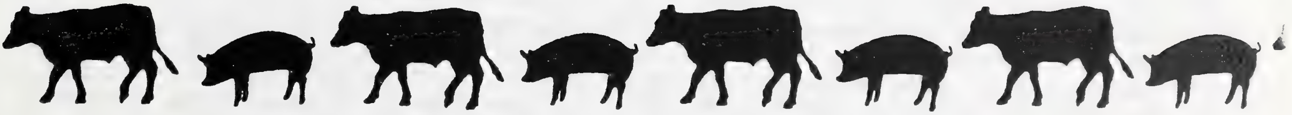

## INTRODUCTION

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# RED MEATS

## TODAY'S PORK

The latest news about pork is that it is one of today's lean meats. Pork lovers are now able to enjoy the taste of their favorite meat, without second thoughts about the fat content. A recently released Agriculture Canada study shows that several retail cuts of pork have a lower fat content than was previously believed. All things being equal, the protein content of an animal increases as the fat content decreases which means better value for the consumer's food dollar. This is good news to the pork industry, which is interested in meeting the demands of today's consumers.

The study involved seven cuts of pork: shoulder butt roast, the loin tenderloin end roast, leg butt portion roast, loin rib end chops, centre-cut loin roast, picnic shoulder roast and side spareribs. When you compare the fat content of the cooked lean portion with the comparable USDA data (1983), Canadian pork is significantly leaner. Canadians are now eating pork that is on average 23 percent leaner than indicated by the current data published by Health and Welfare Canada. In fact, Canadian pork has 11 to 29% less fat than U.S. pork, depending on the cut. This is extremely good news for pork producers, because a tremendous effort has been made in the past 20 years to produce leaner meat. Changes in the Canadian hog grading system in 1968 encouraged the overall production of leaner pork carcasses.

The Agriculture Canada study also determined cooking yields which are useful in comparing cost per serving among different cuts. The average number of 90 gram servings of cooked lean meat per kilogram of raw meat, as purchased, varied depending on retail cut. The shoulder butt roast gave the highest yield, with 5.6 servings, followed by center-cut loin roast at 5.5, loin tenderloin end roast at 5.2, leg butt portion roast at 5.1, loin rib end chops at 5, picnic shoulder roast at 4.7 and side spareribs at 3.9. Consumers can save by comparing the cost per serving on the basis of cooked edible lean meat [illegible] cost per serving varies when bone, fat and other waste are removed

# RAISING PIGLETS ARTIFICIALLY

Raising piglets without a sow requires a great deal of attention and care. In many cases, surplus pigs from large litters or pigs from sows that have died, can not be fostered to sows with spare rearing capacity. As a result, many of these piglets are unable to get a regular and adequate suckle and often become weak and die of malnutrition or starvation.

## COLOSTRUM VITAL

It is essential that piglets receive colostrum as soon as possible after birth. Colostrum or the first milk contains immunoglobulins, a rich source of antibodies, that provide resistance to disease. Leaving piglets on the sow for at least 12 to 36 hours before transferring to an artificial rearing system is preferred.

For the best results piglets should receive colostrum from their own mothers. If not possible, getting the necessary colostrum can be accomplished by milking a newly farrowed sow or alternatively by feeding cow colostrum. Piglets can be dosed (15-20 ml/feeding) several times within the first 24 to 48 hours using a conventional 20 ml syringe. Colostrum can be placed on the back of the pig's tongue or given by a stomach tube.

## ARTIFICIAL FEEDING

Preventing outbreaks of scours is a major concern. Feeding small amounts of commercial milk replacer at frequent intervals is advantageous. The following table illustrates the effect of feeding piglets small amounts of milk replacer, at one-hour intervals rather than four-hour intervals, on the incidence of scours and mortality. With one-hour intervals all pigs regardless of whether nipple- or trough-fed survived.

| No. Pigs | Feedings (hourly intervals) | Automatic Device | Scours % | Mortality % |
|---|---|---|---|---|
| 24 | 1 | Nipple | 6.0 | 0 |
| 24 | 1 | Trough | 4.0 | |
| 24 | 4 | Nipple | 15.5 | 10.4 |
| 24 | 4 | Trough | 33.0 | |

Source: DeBoer and Hurnik, 1984.

## IMPORTANT POINTS TO NOTE

Artificial rearing systems for young pigs must contain the following important features:

1. Accommodation that is clean, dry and never overcrowded.
2. A feeding device that provides piglets with regular, controlled small doses of a liquid diet.
3. Equipment and pens that are readily cleaned and sterilized and present the minimum challenge from pathogenic organisms.
4. A system capable of meeting the piglets environmental needs (i.e. 30-34°C, airspeed less than 0.1 m/sec, insulated or heated lying area).

## ELECTRIC PROPORTIONER MILL CALIBRATION

1. On the calibration work sheet, list the ration, its ingredients, and the percentage of each ingredient required. Also record each dial setting, including the load control dial setting. Ensure that each dial is at its normal setting for that ration.

2. Remove the back housing or cover of the mill, exposing the proportioner augers. Set the diverters so that all ingredients would flow through the grinding chamber.

3. Ensure that ingredients from each chute falls into a separate collection container. Use the largest container(s) for the main ingredients and the smallest container for ingredients added in small amounts.

4. Activate the mill and allow the ingredients to be delivered by the proportioner augers into collection containers. Run the main mill motor during collection, (if safe) as vibration can affect the output of ingredients. Ensure all augers are running full and that no spillage or leakage of ingredients occurs.

MILL CALIBRATION WORKSHEET

RATION TYPE ______________ PROTEIN TARGET (%) ______ LOAD DIAL SETTING ______ DATE ______________

FILL OUT DURING CALIBRATION - USE EITHER METHOD

| FILL OUT BEFORE CALIBRATION | | | | TRIAL 1 *TIME (min.) | | | | | | TRIAL 2 *TIME (min.) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INGREDIENT | REQ'D % IN FEED | PRESENT DIAL SETTING | BIN | TOTAL WEIGHT (kg) | CONT. WEIGHT (kg) | NET SAMPLE WEIGHT (kg) | ACTUAL % IN FEED | ACTUAL ÷ REQ'D | NEW DIAL SETTING ** | TOTAL WEIGHT (kg) | CONT. WEIGHT (kg) | NET SAMPLE WEIGHT (kg) | ACTUAL % IN FEED | ACTUAL ÷ REQ'D. | NEW DIAL SETTING ** | CALIBRATION CHECKS DATE | OK |
| 1. | | | | | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | | | |
| | | | | | Total: | | | | | | Total | | | | | | |

*Record only if using timed calibration method.

**To calculate new dial settings: $\left(\frac{\text{Required \% ingredient}}{\text{Actual \% ingredient}}\right) \times$ Old dial setting of ingredient = New dial setting.

Example: Required % of soybean meal = 15% Old dial setting = 4 New dial setting = $\left(\frac{15}{12}\right) \times 4 = 5$
Actual % of soybean meal = 12%

Adapted from Pork Industry Handbook, PIH94, Purdue University.

5. After enough of each ingredient has been collected, turn off the mill. Weigh collected ingredients, making sure the empty container weights are subtracted from their respective gross weights.

6. Record the net weights on the worksheet and calculate the percentage of each of the ingredients. If the resulting figures differ from the required figures by more than five percent for any ingredient, revise the dial setting.

7. Determine the revised dial settings according to the instructions out-lined on the bottom of the worksheet.

8. Reset the dials and repeat the collection and weighing procedures outlined and record

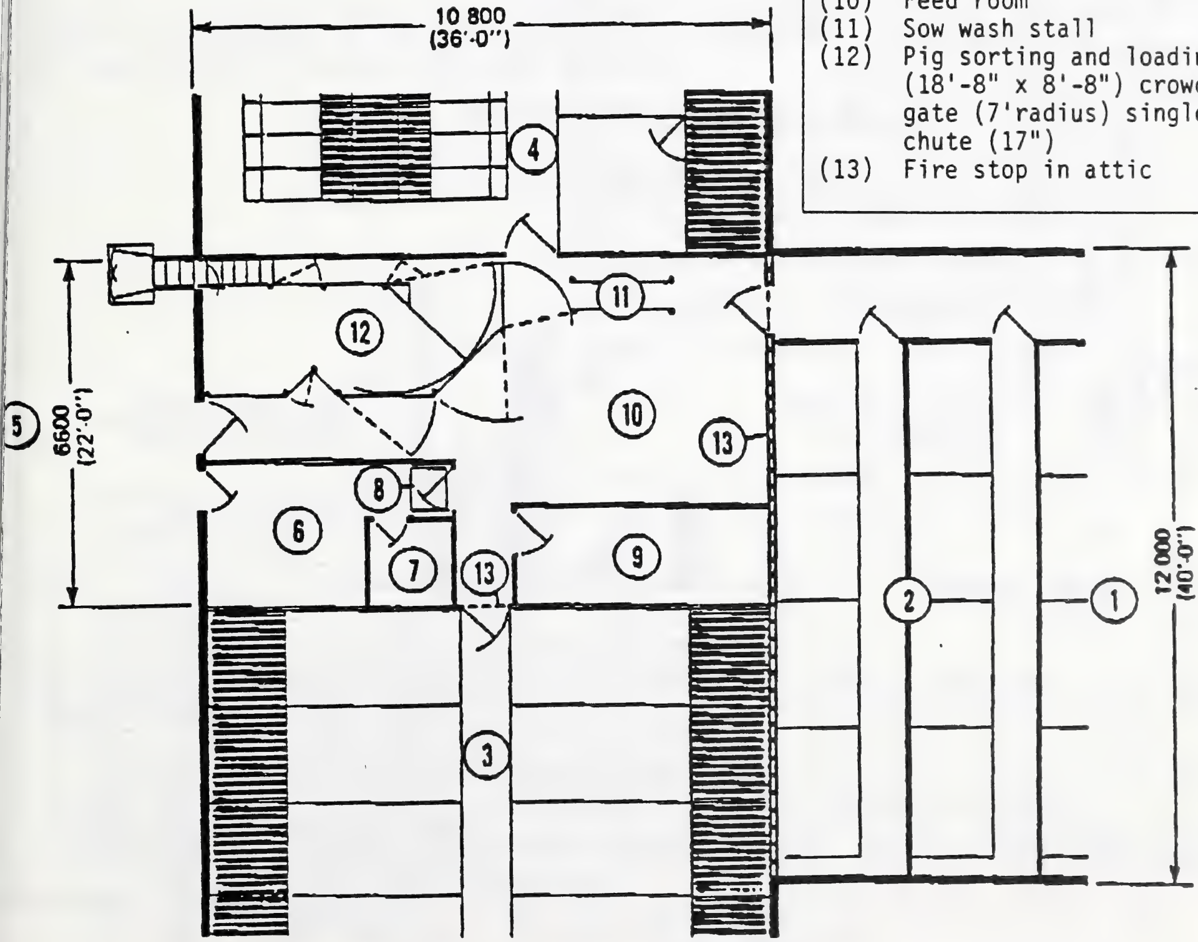
9. If the percentages are still incorrect, use your judgment to make minor dial adjustments until the correct percentages are obtained.

SOURCE: 27th Annual Alberta Feed Industry Conference

# CENTRAL SERVICE AREA FOR PIG BARN

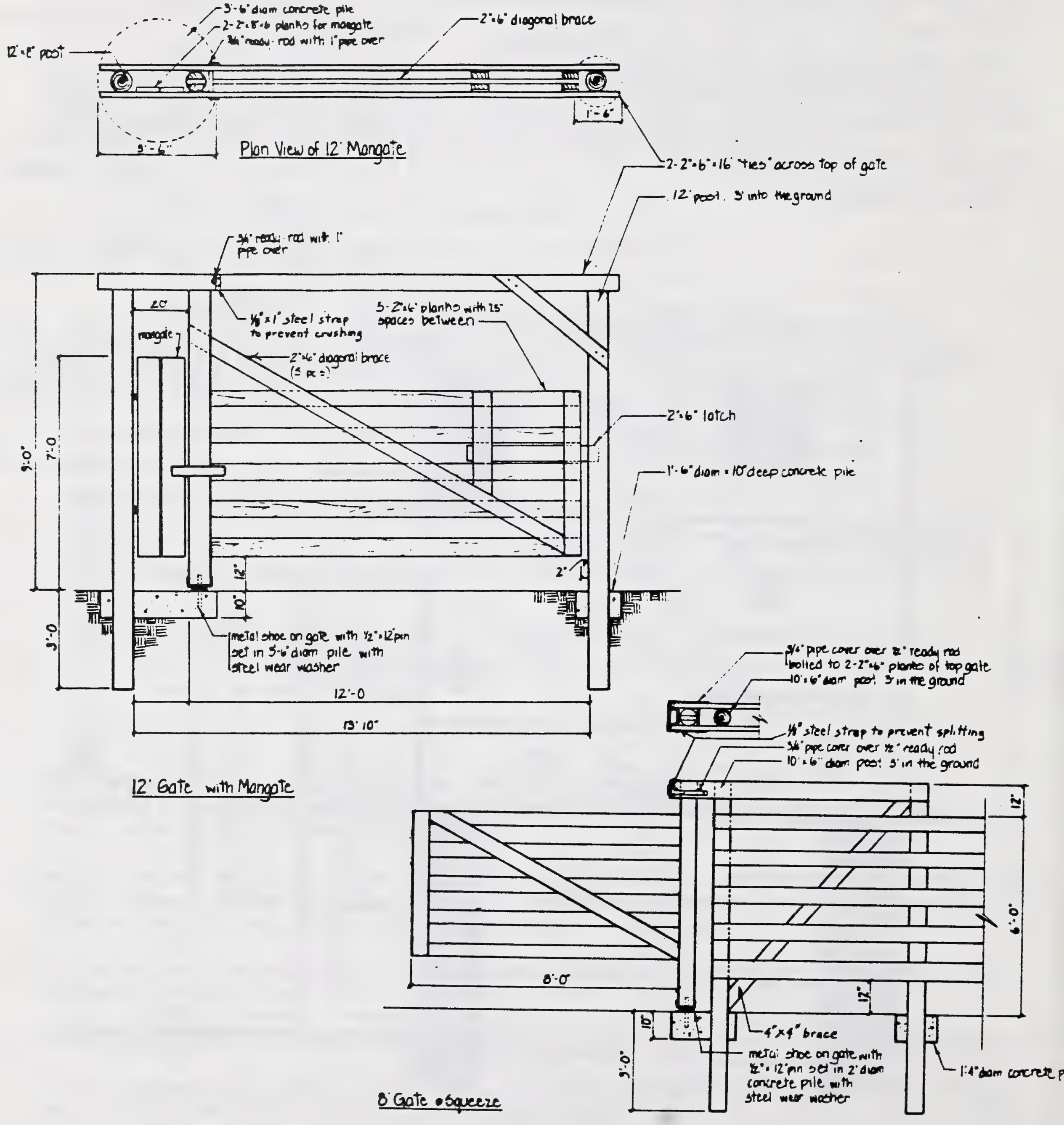
The plan shown below conveniently combines the basic production units around a service core where office, feed, sorting and shipping areas are located. Properly planned, a central service area allows for flexibility in future barn expansions; for controlled access to the barn; and for a pig moving, sorting, and loading area that results in reduced stress for both operators and pigs. Details on this plan and others are available by contacting your agricultural engineer or swine specialist.
(Canada Plan M-3002)

( 1) Farrowing rooms
( 2) Weaner rooms
( 3) Grower/Finisher rooms
( 4) Breeding/Gestation rooms
( 5) Service area (21'-8" x 35')
( 6) Office (10' x 9'-4") Viewing windows to (3) & (12)
( 7) Washroom (5'-4" x 5')
( 8) Disinfecting footbath in floor
( 9) Utilities room (15'-4" x 6')
(10) Feed room
(11) Sow wash stall
(12) Pig sorting and loading area (18'-8" x 8'-8") crowding gate (7'radius) single file chute (17")
(13) Fire stop in attic



# CORRAL GATES

Working corrals can have from 5 to 15 gates depending upon the number of sorts and the general layout of the system. These gates are usually purchased metal gates or welded sucker rod and tubing. At prices of $150 per gate, gates can represent up to 35% of the material cost for a handling system. Here are two inexpensive gates that can be made from planks or metal. These gates can be swung up to 300°. If the gate sags, it can be jacked up and the top pin moved closer to the supporting post. If snow builds up, spaces can be added under the pivoting post, elevating the entire gate.


3'-6" diam concrete pile
2-2"×8"×6 planks for mangate
3/4" ready rod with 1" pipe over
2"×6" diagonal brace
12'×8" post
1'-6"
3'-6"
2-2"×6"×16' "ties" across top of gate
12' post, 3' into the ground
3/4" ready rod with 1" pipe over
1/8"×1" steel strap to prevent crushing
5-2"×6" planks with 15" spaces between
20"
mangate
2"×6" diagonal brace (5 pcs)
2"×6" latch
1'-6" diam × 10' deep concrete pile
9'-0"
7'-0"
12"
2"
10"
3'-0"
metal shoe on gate with 1/2"×12" pin set in 3'-6" diam pile with steel wear washer
12'-0
13'-10"
3/4" pipe cover over 1/2" ready rod bolted to 2-2"×6" planks of top gate
10'×6" diam post 3' in the ground
1/8" steel strap to prevent splitting
3/4" pipe cover over 1/2" ready rod
10'×6" diam post 3' in the ground
12"
6'-0"
8'-0"
12"
10"
3'-0"
4"×4" brace
metal shoe on gate with 1/2"×12" pin set in 2' diam concrete pile with steel wear washer
1'-4" diam concrete p

Plan View of 12' Mangate

12' Gate with Mangate

8' Gate • Squeeze

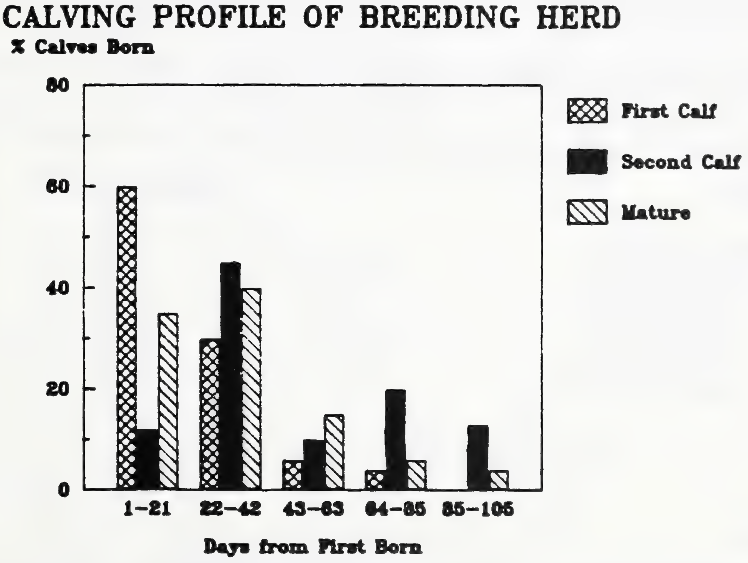
(Source: T. Jones, Fairview)

# CALVING PROFILES

A calving profile is a graph showing the percent of calves born per 21 day period throughout the calving season. The big advantage of drawing a graph is to give an overview of the calving season. After all, the old saying "A picture is Worth a 1000 Words" is still true today.

The information required to draw a calving profile is:
- . date of first calf born
- . # of calves born (alive and dead) per 21 day period to either first calf, second calf or mature cows
- . date of last calf born

The date of first calf born becomes day 1 of the calving season. Calves born within the next 21 days are grouped together. Cows from these calves will have conceived within the first 21 days or first estrus period of the breeding season. Calves born from day 22 to day 42 will have conceived in the second estrus period and so on. The calves should be grouped by age of mother so that calves born to either first calf, second calf or mature cows can be separated out for each 21 day period. To convert these figures to a percent, divide the # of calves born per 21 day period from each cow age group by the total # of cows to calve in that age group. These figures can then be graphed. (Ideally there should be approximately 70% of the herd calving in the first 21 days, 20% in the second 21 days and 10% in the third 21 days period).



The above calving profile illustrates a typical calving season. The above graph shows the following:

1. the calving season is extended to 105 days.
2. cows are not ready for rebreeding within the first cycle (21 days) of the breeding season.
3. second calf cows have the worst calving profile. They are under additional stress then the other cow groups.
4. the first calf heifer's fertility appears okay, but there are 10% of the heifers that took longer than 42 days to conceive.

This type of information is helpful in evaluating the management of the cow herd. Often if the first and second calvers are managed well, the mature cows should follow with few

# SHRINKAGE IN BEEF CATTLE

In cattle marketing the highest price per pound does not necessarily mean the highest return. The number of actual pounds involved may be more important. For this reason shrinkage is an important consideration in hauling cattle. For cattle sold on a per pound basis, shrink directly influences sale value; a 5% shrink means a 5% reduction in receipts.

Weight loss in cattle can be classified according to two types of shrink according to R. Brownson from Montana State University.

1. Excretory shrink or body fill
   - Animals held off water for a 12 hour stand usually only have excretory shrink. A relatively short period on feed and water will refill the stomach and bring the animal's weight back to normal.

2. Tissue shrink
   - This is a decrease in carcass weight and occurs on long, extended hauls or during long periods of fasting.

The loss weight from overnight shrink will vary with the type of feed consumed. Cattle on grass or silage will generally shrink 4% while fat cattle on high grain will shrink 2.5% to 3% if no feed or water is available.

In addition, cattle will shrink more in a strange pen than in familiar surroundings. One study found an average shrink of 7.2% on cattle purchased from a rancher and 9.1% from an auction.

The following table shows estimated shrinkage lost under different conditions:

| Conditions | Percent Shrink |
|---|---|
| 8 hr. drylot stand | 3.3% |
| 16 hr. drylot stand | 6.2% |
| 24 hr. drylot stand | 6.6% |
| 8 hrs. moving truck | 5.5% |
| 16 hrs. moving truck | 7.9% |
| 24 hrs. moving truck | 8.9% |

## PREVENTING SHRINK

- Check weather forecasts to avoid possible problems.
- Give attention to loading chutes, holding pens, trucks and road conditions.
- Don't overload --- overcrowding causes stress.
- Provide adequate protection in extremely cold, hot or wet weather. Cover trucks if possible.
- Do not overfill cattle before hauling. They could be discounted. Provide good dry feed before moving and provide rest stops along the route if going long distances.

The role of management to reduce shrinkage is critical and does not end just because a sales decision has been made.

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CANADIANA

# BEEF 'N' BACON

Alberta
AGRICULTURE

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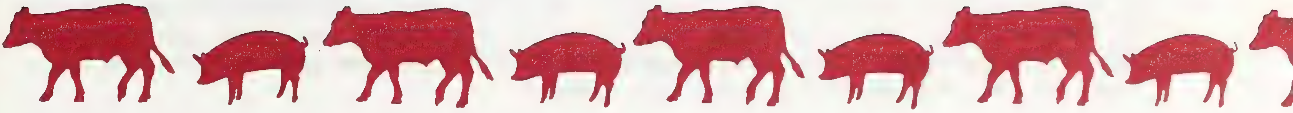

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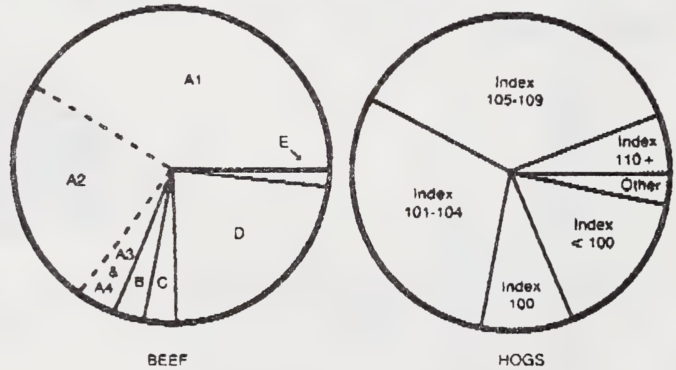
# RED MEATS

## MEAT INDUSTRY RESPONSE TO CONSUMER'S CONCERNS

Among the Nutrition Recommendations for Canadians is a reduction in calories from fat. Excessive dietary fat has been implicated in coronary heart disease and certain kinds of cancer. Understandably consumers are shopping for lean meat in an effort to cut down on dietary fat. Different segments of the animal industry have taken steps to decrease the fat content of their products, although not exclusively for nutritional reasons. Canada introduced a new beef carcass grading system in 1972 which was designed to encourage the production of leaner beef. Over a ten-year period total lean output from beef carcasses increased by 7%. This change can probably be attributed to a general reduction in the stage of maturity at slaughter and to the use of later fattening breeds in cross breeding programs. Research has confirmed that Canadian prime cuts of beef are substantially lower in fat content than their U.S.A. counterparts. Further revisions to the Federal Beef Grading Regulations were made in 1978 and 1986 to reflect this trend.



PROPORTION OF CARCASS GRADES IN CANADA, 1984.

The vast majority of Canadian beef and hog carcasses graded in the leanest categories

Similarly, the most significant change in pork product composition has been in the amount of fat. A new grading system was introduced in 1968 which was based mostly on carcass weight and backfat thickness. Over the following 14 years, an increase of almost 12% in lean pork output was observed, with both increased carcass weight and reduced carcass fat as contributory factors. Canadian pork retail cuts are lower in fat than published American ratios.

Minimizing salt intake to minimize hypertension in certain individuals is another nutrition recommendation for Canadians. Again the meat industry has responded. The sodium content of processed meats such as bacon and ham is 25% less compared to 25 years ago.

# SIMPLE RECORDS THAT MAKE CENTS

A simple effective record keeping system is essential for every swine enterprise. There are some producers who keep mountains of figures on their enterprise, but never take that extra step to analyse these records to tell them what's going on. Then there are those who keep no information. In between these extremes is a system that keeps some basic figures on production and then uses these to get useful information about overall production.

Without simple effective records, it's very difficult for a producer, veterinarian or swine specialist to pinpoint areas that need improvement.

The growing finishing barn is one area where few people keep effective records. Here are some examples of what can be done by keeping some basic records and analysing them with simple formulas.

(A) Calculating Days In An Area: Each month, Days in an area (i.e. Weaner Barn) can be calculated using the following formula:

$$\text{(1) Days in Area} = \frac{\text{Ending Inventory (2)}}{\text{Pigs Added per Month (3)}} \text{ X } 30.5$$

Record Pigs In, Pigs Out and deaths evey month. A regular head count should be taken to verify numbers. An example of calculating days in an area using a Grower-Finishing Barn:

Jan. 1 = 1000 pig inventory (these were counted)

Feb. 1, inventory = 1000 + 250 added (3) - 200 sold - 5 deaths = 1045 (2)

$$\frac{\text{(Feb. inventory ) } 1045 \text{ (2)}}{\text{(Pigs added) } 250 \text{ (3)}} = 4.18 \text{ x } 30.5 \text{ days} = 127.49 \text{ days (1)}$$

March 1, inventory = 1045 + 260 added (3) - 300 sold - 7 deaths = 998 (2)

$$\frac{\text{(March 1 inventory) } 998 \text{ (2)}}{\text{(Pigs added) } 260 \text{ (3)}} = 3.84 \text{ x } 30.5 = 117.12 \text{ days (1)}$$

(B) Calculating Average Daily Gain:

$$\text{(4) Average Daily Gain} = \frac{\text{live market wt per pig (5) - beginning pig wt (6)}}{\text{days in the system (1)}}$$

Weight into the barn and weight out would have to be recorded. An example using the same barn used in A:

$$\text{January: } \frac{\text{220 lbs (5) - 50 lbs (6)}}{\text{127.49 days (1)}} = \text{1.33 lbs/days (4) (ADG)}$$

$$\text{February: } \frac{\text{224 lbs (5) - 48 lbs (6)}}{\text{120.54 (1)}} = \text{1.46 lbs/day (4) ADG}$$

Feed conversion, average daily feed intake, and percentage mortality are examples of other numbers that can be generated out of some basic records.

All these calculations should be done for at least 4 months before accurate figures are generated.

For more information on record keeping, contact your nearest Swine Specialist.

# PREVENT SULFA DRUG RESIDUES

Sulfa-containing drugs are valuable production aids in today's swine industry. They are extremely useful as feed and water medicants or injectables for the prevention and treatment of specific swine diseases. However, the use of these medicants beyond the limits of current regulations can result in residues in pork products. These products are then deemed unacceptable for human consumption. The current allowable level of sulfamethazine in edible tissue is 0.1 ppm.

## KNOW THE SOURCES

Commonly available sulfa-containing drugs are:

- AUREO SP250
- SULFAMETHAZINE
- CHLORACHEL 250
- CHLOR 250
- AUREOMIX
- TYLAN 50/SULFA G
- SUPER CHLORACHEL 250
- SUPER CHLOR 250

## COMMON CAUSES OF RESIDUES

Sulfa residues found in meat products are often the result of:

1. Failure to observe proper withdrawal times.
2. Consumption of residual or contaminant amounts of sulfa drugs up to slaughter time.

It doesn't take much medication to cause a problem. Research has shown that many drug residue violations are the result of low level contaminations. Some known observations are:

- Contamination as low as 2.0 ppm in a finisher ration can result in residue levels of up to 0.1 ppm in liver tissue. A quarter teaspoon of sulfamethazine in a tonne of feed is enough to cause tissue violations.
- As little as 18 kg of medicated feed (containing 110 grams/tonne of sulfamethazine) will contaminate a tonne of clean feed.
- Drug carry over in water lines from medicated water has been reported to last up to 2½ months.
- Sulfa-free pigs placed in pens containing manure from pigs fed sulfa drugs end up with violative tissue residues within 48 hours.

## PREVENTING POTENTIAL PROBLEMS

Proper handling and feeding procedures for sulfa products can not be over-emphasized. Producers must observe the following procedures:

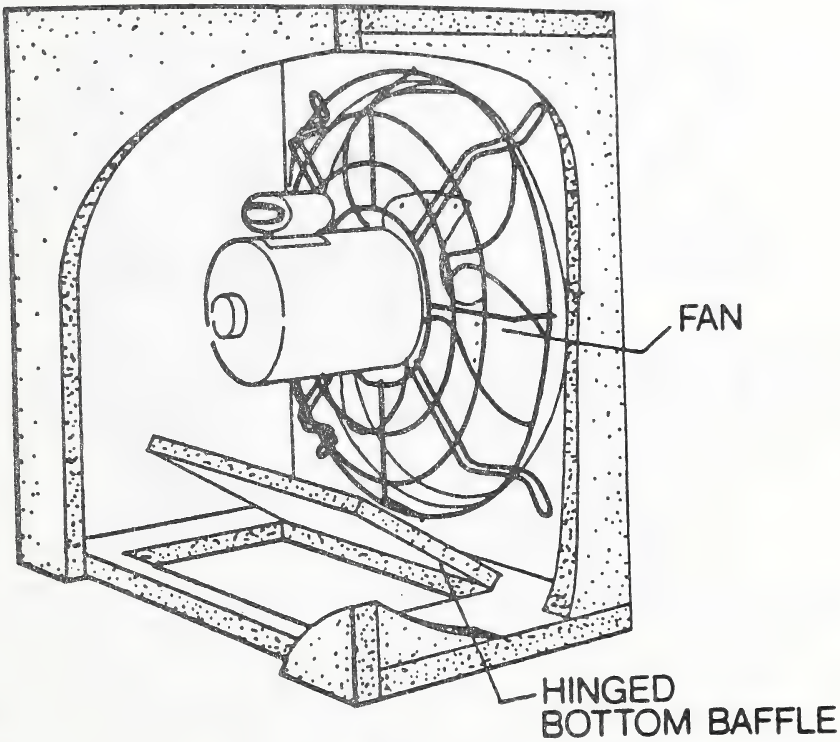
- Mix all sulfa-medicated feeds at one time. Flush all feed mixing, handling and storage bins with non-medicated grain or feed (preferably an early grower ration).
- Read and observe all label directions regarding withdrawal times. Sulfa products are cleared for routine use in prestarter and starter rations only. They can be used up to 10 days prior to slaughter only under a veterinary prescription.
- Insist that medicated feeds be properly identified by your feed supplier. Use separate storage bins for medicated feeds.
- Minimize pig contact with contaminated feces. Place solid wall pen partitions between pigs receiving medicated and non-medicated feeds. Move pigs destined to slaughter to drug withdrawal pens. Be aware of potential problems with recirculating flushing manure systems.

Keeping drug residues out of your pork products is your responsibility. Prevent potential problems by keeping sulfa drugs out of all hog grower and finisher rations.

# FAN BACK-DRAFT DAMPER

During cold weather the louvers on larger summer fans are often sealed to prevent air leakage. It is important, however, that these fans continue to operate automatically as room temperatures increase.

Alternatively, a temporary winter back-draft damper can be fitted over the fan (see figure below). This eliminates air leakage while at the same time allowing the fan to operate normally as needed. The damper can be constructed of polystyrene with a hinged baffle that seals more positively than normal fan louvers and is also less susceptible to icing.

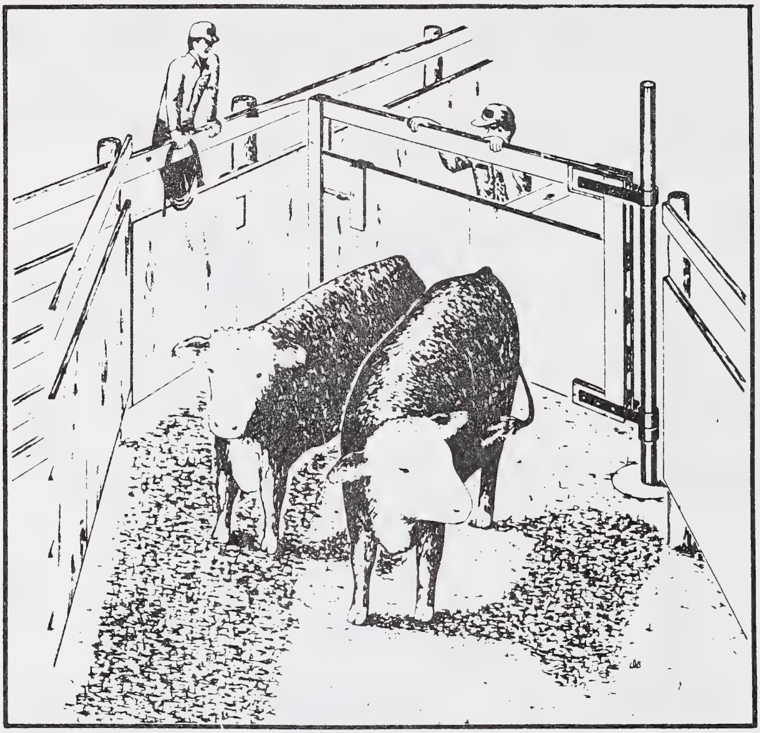


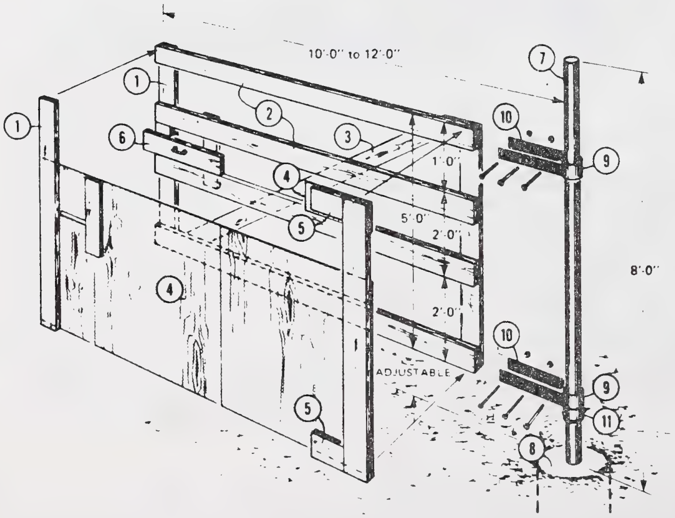
- Polystyrene construction. Use latex-based contact cement. Hinge made of fabric material glued to baffle and damper box.
- Fasten to the wall using rubber tarp straps.
- Remove during summer months. Dampers are less efficient than louvers and can significantly reduce fan capacity.

# CROWDING GATES

Not only should a crowding gate be built strong, but it must also be capable of rotating at least 300°. A 300° rotation is accomplished by a well placed pivot post. Pivot posts made of 3 1/2 in diameter pipe and embedded in concrete work well for a crowding gate. Use 4 inch diameter sleeve hinges to attach the gate. The gate works best with latch stops at several points in its swing along the funnel wall. Use a solid gate to keep the cattle from seeing through it.

**CROWDING GATE**





| | |
|---|---|
| 1 | 1" × 6" gate uprights |
| 2 | 2" × 6" gate rails |
| 3 | 1" × 6" cross bracing |
| 4 | 3/8" sheathing plywood , face grain vertical |
| 5 | 1" × 6" spacer blocking |
| 6 | latch board from 2" × 6"; U-bolt handle |
| 7 | 3½" × 12'-0" long pipe post |
| 8 | concrete backfill to 4'-0" deep; in soft soils, increase diam. of post hole and concrete |
| 9 | 4" pipe × 3" long hinge sleeve (rotates on post ⑦ ), grease as necessary |
| 10 | 3/8" × 3" × 1'-4" hinge strap (weld to hinge sleeve ⑧ ) secure to gate members with 3/8" machine bolts |
| 11 | 4" pipe × 3" long collar; drill post ⑦ and collar for 3/8" bolt, drill additional holes in post for vertical adjustment |

# PREDICTING BIRTH WEIGHTS

The weight of the calf at birth has been identified as the single most important factor contributing to calving difficulty. In fact, 50 to 60% of the variability in calving difficulty can be accounted for by birth weight. It would therefore seem appropriate that if we want to reduce calving difficulty, we must lower birth weights. There are differences between breeds for calving ease, so breed selection is important. Also important is the particular sire line. Certain sires have a history of difficult births either because of birth weight or conformation. Studies from the University of Alberta found both the sire's birth weight and the dam's birth weight as factors contributing to future calving difficulties. Sires that were either excessively large at birth, required calving assistance, or came from a line with a history of difficult births, should be avoided. Similairly, replacement heifers should have been born unassisted and with moderate birth weights.

The following table illustrates what influence sire and dam birth weights have on the offspring's birth weight. When calculating this table, I assumed that birth weight is 40% heritable. That is, 40% of the difference in birth weight can be accounted for by genetics.

To read the table, one needs to know 3 factors.

1. Sire's birth weight
2. Dam's birth weight, or average for the herd or breed average
3. Average birth weight of last years calves. If unknown, assume the weight is equal to the dam's birth weight.

For example, if the last years calves had an average birth weight of 90 lbs and the dam had a birth weight of 90 lbs, then selecting a 100 lb birth weight bull would increase calf birth weight by an average of 2 lbs. This is calculated as follows:

Change = ((dam birth wt - LC) x $h^2$ x .5)) + ((sire birth wt - LC) x $h^2$ x .5))

Where: $H^2$ = heritability of birth weight or 40%
LC = last years calf birth weight

Selecting a 120 lb birth weight bull could increase birth weight an average 6 lbs. These increases seem small, but will have a major impact on whether calving difficulty occurs. The calculated values in the table will be reasonably close over a large number of animals. The table can be used as a rule of thumb to predict a trend, rather than an absolute change.

EXPECTED DIFFERENCES IN BIRTH WEIGHTS

| AVERAGE BIRTH WEIGHT OF LAST YEARS CALVES (LBS) | DAM BIRTH WEIGHT (LBS) | SIRE BIRTH WEIGHT (LBS) | | | |
|---|---|---|---|---|---|
| | | 80 | 100 | 120 | 140 |
| 80 | 80 | 0 | +4 | +8 | +12 |
| | 90 | -2 | +2 | +6 | +10 |
| | 100 | -4 | 0 | +4 | + 8 |
| 90 | 80 | -4 | 0 | +4 | + 8 |
| | 90 | -2 | +2 | +6 | +10 |
| | 100 | 0 | +4 | +8 | +12 |
| 100 | 80 | -8 | -4 | 0 | +4 |
| | 90 | -6 | -2 | +2 | +6 |
| | 100 | -4 | 0 | +4 | +8 |

# ASSESSING BEEF ALTERNATIVES

"Would I be better off backgrounding or finishing out my calves rather than selling them at weaning time?" If I background or finish my calves at home I would have to reduce my cow herd in order to have enough hay to feed to the calves. How will this affect my income? The answers to these questions are not straight forward. It will depend on the market prices in the future and on what kind of performance is achieved in the backgrounding or finishing program. In order to provide some insight into these questions five different enterprises were examined by using a computer model to simulate net cash income over the past seven years. The basic conditions used in the simulation model are as follows:

1. The five enterprises examined were: (i) 150 cow-calf enterprise, sell weaned calves in October, (ii) 132 cow-backgrounder enterprise, 1.25 lbs/day rate of gain, sell in February, (iii) 132 cow-backgrounder enterprise, 2.1 lbs/day rate of gain, sell in February, (iv) 117 cow-backgrounder enterprise, 1.25 lbs/day rate of gain, sell in May, (v) 125 cow-finish enterprise, 2.25 lbs/day rate of gain, sell in July.
2. The example farm has 300 acres of hay which will support a herd of 150 cows when calves are sold at weaning. When calves are kept on the farm for backgrounding or finishing the cow herd size is reduced in order to provide hay for the calves.
3. Crop production and crop production costs were kept constant over the seven year period.
4. Livestock production and livestock expenses for each enterprise were kept constant over the seven year period.
5. Culling rates and calving percentages were the same for each of the five enterprises.
6. Actual monthly average cattle prices for the past seven years were used in calculating income for each year.

NET CASH INCOME LESS FIXED FEEDING EXPENSES

| | Cow-Calf 150 Cows 550 lb strs (Sell Oct) | Cow-Background 132 Cows 700 lb strs (Sell Feb) (180 days) (94 head) | Cow-Background 132 Cows 800 lb strs (Sell Feb) (120 days) (94 head) | Cow-Background 117 Cows 800 lb strs (Sell May) (210 days) (83 head) | Cow-Finish 125 Cows 1150 lb strs (Sell July) (270 days) (88 head) |
|---|---|---|---|---|---|
| 1987 | $49,017 | $43,705 | $44,589 | $43,379 | $54,927 |
| 1986 | $44,765 | $35,103 | $38,983 | $29,233 | $39,937 |
| 1985 | $35,777 | $34,401 | $37,928 | $30,557 | $31,059 |
| 1984 | $33,601 | $34,938 | $36,436 | $26,441 | $38,327 |
| 1983 | $27,574 | $28,438 | $31,361 | $25,711 | $37,434 |
| 1982 | $29,078 | $24,455 | $31,361 | $26,740 | $39,255 |
| 1981 | $27,312 | $33,441 | $36,970 | $29,035 | $36,759 |
| TOTAL For 7 Years | $247,124 | $234,481 | $253,335 | $211,096 | $277,698 |
| Highest | $49.017 | $43,705 | $44,589 | $43,379 | $54,927 |
| Lowest | $27,312 | $24,455 | $27,068 | $25,711 | $31,059 |
| Range | $21,705 | $19,250 | $17,521 | $17,668 | $23,868 |

Net Cash Income is the amount of cash flow generated by the enterprise that is available for covering depreciation on equipment, family living costs, debt servicing, savings and/or expansion. "Fixed Feeding Expense" is an allowance for extra labor and facilities which are in addition to those required for the cow herd. (ie. the back-grounding and finishing enterprise would require more labor and facilities than would the cow-calf enterprise). 'Fixed Feeding Expense' was calculated at $.15/head/day.

This simulation exercise indicates that over the period 1981 to 1987 the cow-finish enterprise produced the highest total return. Return to the cow-finish enterprise was highest in four out of the seven years and in one year (1985) was second lowest. The cow-finish enterprise had the greatest variation between highest and lowest income years.

Source: (Bob Winchell, Alberta Agriculture)

BEEF 'N' BACON

Alberta
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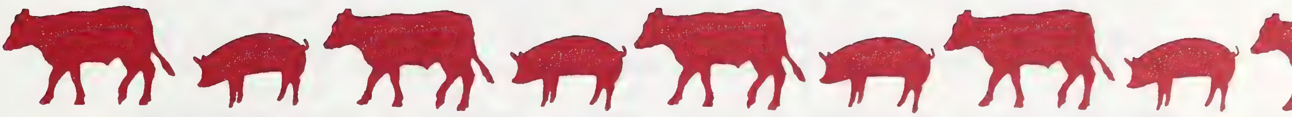

# INTRODUCTION

Beef'n'Bacon was initiated in the fall of 1985 as a winter livestock program for the North West Region of Alberta. In 1987 it was expanded to include the North Central Region. The newsletter's objective is to reach livestock producers with timely and pertinent topics. It is not our intention to explain the subject matter in elaborate detail. Instead, we hope to spark your interest.

Issues of Beef'n'Bacon are distributed to approximately 4300 livestock producers and agri-businesses in Alberta. It is written and edited from the Barrhead and Red Deer Regional Offices. District Comments (optional) are added by the District Agriculturist.

More information on all articles is available by contacting your District Agriculture Office or:

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# RED MEATS

## RED MEAT IS NUTRIENT DENSE

Nutrient density is a way of evaluating the nutritional quality of a food by comparing the amounts of nutrients it contains against the amount of energy or calories it provides. Another way of looking at nutrient density is to think in terms of your "energy budget" for the day. Suppose, for instance, that your body size and activity pattern require an energy intake of 8.4 megajoules (MJ), or 2000 kcal, per day. The food choices you make as you spend your energy allotment must also supply your needs for all essential nutrients. When you choose foods that are low in energy but high in nutrients you will meet these needs. But if you choose foods that are high in energy but low in nutrients, you will reach your energy limit before your micronutrient needs are supplied. In recent decades energy intakes have declined in Canada. However no matter what your energy intake, your nutrient needs remain relatively constant. At very high levels of energy intake, it is not very difficult to obtain adequate amounts of all the needed nutrients, but at lower levels, food selection must be made more carefully. The foods eaten must be nutrient-dense.

Nutrient density enters the picture when we see how much good nutrition red meat has to offer for a low contribution to daily calories. In a 2000 calorie diet, a 90 gm or single 3 oz serving provides, in addition to excellent protein, measurable amounts of niacin, riboflavin, thiamin, vitamin B12, zinc and iron. Most of the iron in beef and a large share of the iron in pork is of the type called "heme iron", five to ten times more available to the body than non-heme iron found in other foods. When meat is eaten along with other iron sources, it even increases the usability of non-heme iron, (as long as the non-heme iron is consumed in the same meal as the meat).

Nutrient density is another reason why today's red meat is a wise food choice for a diet designed for optimal health.

# STILLBIRTHS: GREATEST CAUSE OF MORTALITY

High stillbirth rates mean lost opportunity. The average stillbirth rate is around 7%, but many herds have over 10% stillbirths. Less than 5% stillbirths is possible on most farms. (See Beef 'N' Bacon March 1987 for definitions of stillbirths).

## Some Facts on Stillbirths

(1) Around 40% of sows have all the stillbirths.
(2) 1/2 of this 40% have one stillbirth per litter. The other 1/2 (or 20% of all sows) have over one stillbirth and cause the high stillbirth rate.
(3) A high stillbirth rate in one litter means a high rate in the next litter.
(4) Anemic sows have a high stillbirth rate.
(5) Thin, old or fat sows have a high stillbirth rate.
(6) Some lines within breeds have a higher stillbirth rate.
(7) Some boars produce higher stillbirth rates.
(8) Large litters have more stillbirths.
(9) Very small litters (3-5 pigs) have a larger percentage stillbirths.

TABLE 1 Risk Factors Which Influence The Birth of Stillborn Pigs

| FACTOR | RISK |
|---|---|
| PARITIES 1 & 2 | 15% |
| PARITIES 3 & 4 | 25% |
| PARITIES 5 & 6 | 35% |
| PARITIES > 7 | 45% |
| S.B. IN PREVIOUS LITTER | + 30 |
| PREVIOUS LITTER SIZE > 12 | + 15 |

From: Dr. Tim Blackwell, U. of MN.

## What Can We Do To Reduce Stillbirths

(1) From your records find out what your stillbirth rate actually is.
(2) Treat your sows gently; sows that are scared of you will have more stillbirths.
(3) Prostoglandins can be used to induce farrowing in the high risk group. Farrowing can then be attended.
(4) Use Table 1 to determine which sows are in the high risk group. The risk factor in Table I is additive. Use these high risk figures to determine each sows risk of stillbirths before farrowing.
For example: We have a sow farrowing with her 6th litter (6th parity), she also had over 12 pigs in her last litter and had stillbirths in her last litter. This sows risk would be 35 & 15 & 30 = 80%? The chance of this sow having stillbirths is 80%. This sow would be worth supervising while farrowing.

# SELECTING A DISINFECTANT

Studies have shown that a regular sanitation and disinfection program can reduce baby pig mortality by 3 to 4% and reduce grower-finisher days to market by 7 to 10 days. Good hygiene should achieve both a reduction in the overall number of microrganisms, plus a reduction in the number of specific pathogens (disease causing organisms, ie. "E.coli") in the pig's environment.

Producers should not become overly dependent on disinfectants. It can be stated that 90% of disease control comes from regular cleaning and washing.

## BASIC STEPS

- Remove all manure from pen. Many disinfectants do not work in the presence of organic matter.
- Wash down room or pen with a high pressure hose (preferably hot water). Detergents improve and speed up cleaning.
- Disinfect with an appropriate product. Follow label directions, dilution rates and precautions.
- Let room air dry completely before adding animals.

## THE RIGHT DISINFECTANT

The type of disinfectant you select depends on your objectives, barn conditions, disease status, equipment and cost. The following table can be used as a guide in choosing an appropriate disinfectant. Some examples are listed for each category.

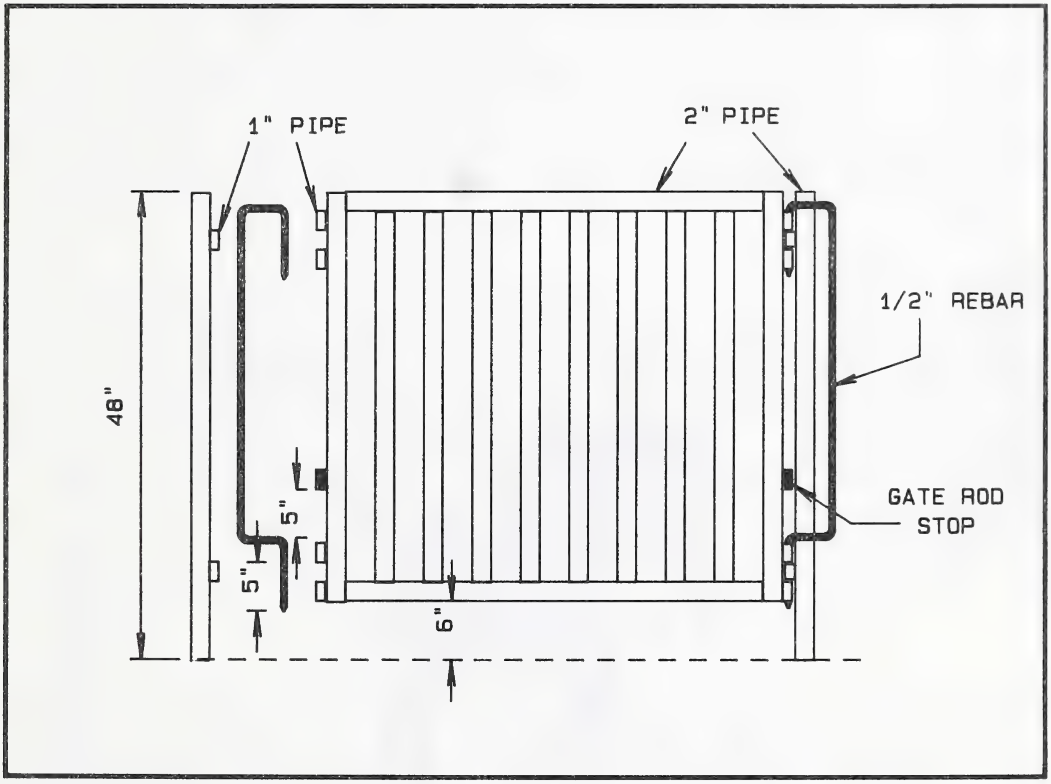
| TYPE | CHARACTERISTICS | EXAMPLES |
|---|---|---|
| Phenolics | Rapid action<br>Effective with organic matter and in hard water<br>Effective for bacteria, some viruses, some fungi | Cresol<br>Lysol<br>Lysovet<br>Phenol-kill<br>One-Stroke Environ |
| Iodophors (Iodine Based) | Rapid action<br>Effective for bacteria, fungi, some viruses<br>Inactivated by organic matter<br>Irritant to skin, eyes and metal | Betadine<br>Bridine<br>Wescodyne<br>Iosan |
| Hypochlorites | Rapid action, but short<br>Irritant to eyes and skin<br>Inactivated by organic matter<br>Effective for bacteria, fungi | Chlorox<br>Javex<br>Chloramine-T |
| Quarternary Ammoniums (Quats) | Anti bacterial only<br>Inactivated by organic matter<br>Neutralized by some soaps | Mikro-Quat<br>Permex<br>Hibitane |
| Formaldehyde | Effective for viruses, bacteria, fungi<br>Slow action, irritant and toxic<br>Effective in organic matter | Lysofume<br>Cidex<br>Formaline + $KMnO_4$<br>Gluteraldehydes |
| Alkalies | Effective for bacteria, fungi, viruses<br>Caustic to metal, painted wood, skin<br>Effective in organic matter | Lye<br>Quick lime (calcium oxide)<br>Slack lime |

(Adapted from: C. Rhodes, Alberta Pork Seminar, 1988)

# DUAL PURPOSE GATE LATCH HINGE

If you are building or remodelling pen gates, the unique latch-hinge shown below may be just what you've been looking for. This gate allows pigs to be easily sorted or moved in the growing-finishing or breeding areas.

The latch pin always stays with the gate so there is no more searching when you need it. The pointed end of the rebar pin makes it easy to guide the latch into the locking mechanism. In addition, the gate opens from either side so you will never get caught between an exiting boar or group of pigs.



CONSTRUCTION DETAILS

- Six pieces of 1-inch pipe should form two sets of three latch holes. Two center hole pieces are welded to the stationary post while the remaining four pieces are welded to the end of the gate.
- Shape the 1/2-inch rebar as shown and place it in the hinge on the gate.
- Weld gate rod stops on the gate at a point that allows the latch pin to be pulled (and the gate opened) but prevents the pin from leaving the latch holes.

Source: University of Nebraska

# HOT WIRE CROWDING GATE

Everyone likely has a corral or pasture gate where it is difficult to chase livestock thru. And, if by yourself, it becomes impossible to chase cattle thru that gate. Here is a simple inexpensive way to solve a difficult problem.

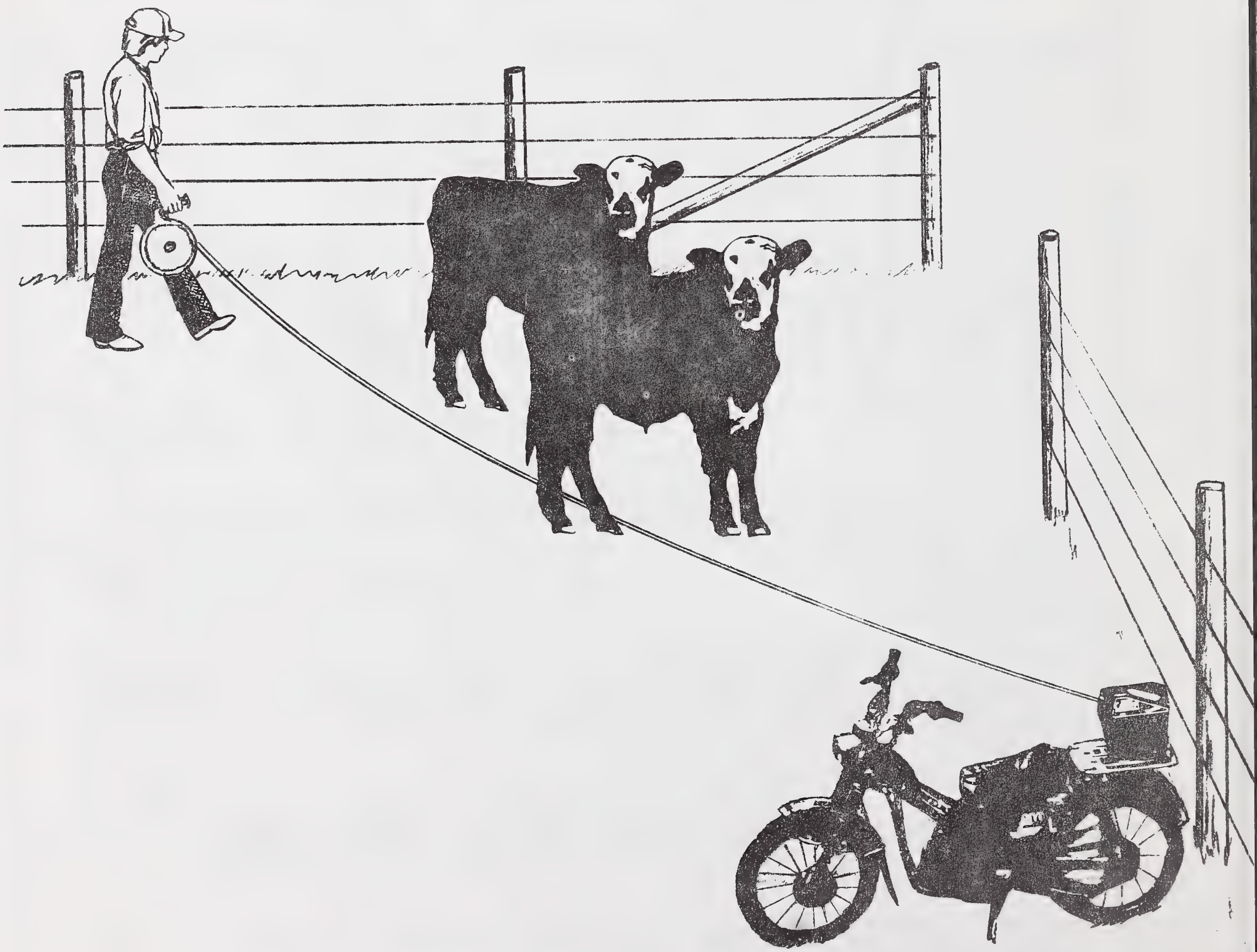
The materials required are: 1) a roll of polytape (a plastic highly visible tape with steel wires interwoven in the tape)

2) an electric fence reel or spool

3) an energiser (similar to the Gallagher G363 or PEL PE5 which are powered by D cell batteries or an energiser powered by a 6 or 12 volt battery)

4) a plastic flexible step-in post (optional)

The system works by first locating your trike or energizer a comfortable distance from the gate you wish to chase the cattle thru. Attach the poly tape to the energiser and with the fencing reel, walk around the cattle. For a large number of cattle, the trike or energiser would be located further from the gate than with a small number of cattle. As you walk around the cattle, slowly uptake the polytape onto the reel. Providing your cattle respect electricity, they will be compelled to go thru the gate. A flexible plastic step-in post can be located a short distance from the trike and act as a pivot for the polytape.



(Darrel Robinson, Fort Assiniboine)

# PROTEIN CREEP FEED FOR SUCKLING CALVES

Producers are always looking for methods to increase calf weight gains that are economical and easy to use. With this in mind a creep feeding trial was conducted during the 1987 summer in the Castor area of Central Alberta. In the past, creep feeding has been considered restricted feeding of either whole oats or oats and a small amount of protein to suckling calves. In this trial, the creep feed differed, in that it was a straight protein supplement; ie. 50% canola meal and 50% soybean meal. Why protein? The protein content in grasses starts relatively high (in excess of 15%) and declines rapidly as the plant matures. By heading time, grasses may have less than 9 or 10% protein. For the suckling calf, even with a little milk from mom, protein could be limiting.

In mid May, 48 cows and suckling calves were split into two treatments - a control and a treated group and placed on a pasture that had been fenced in half. The treated calves were given unlimited access to a creep feeder containing a 50:50 canola/soymeal creep feed. The calves received this mixture til August 15. At that time, calves were too big for the self feeder used. All calves were weighed at turnout (May 17), day 72 (July 28) and day 121 (September 15). Pasture conditions for the first period (day 1 to 72) were extremely dry. However, August rains provided excellent late summer and fall pasture.

The calves were slow to start eating the creep feed. Initially, 100% canola meal was used but the calves found it very unpalatable. The addition of 50% soybean meal stimulated consumption, such that over the trial period, the calves comsumed 0.5 lb/head/day. Had the calves consumed greater than 1.0 lb/day of creep feed, consumption would have been restricted, say by the use of 10% course white salt.

The daily gains for both groups of calves are:

| | May 17 to July 28 | July 28 to Sept 15 | Overall |
|---|---|---|---|
| Creep Feed | 3.45 | 2.45 | 3.08 |
| Control | 2.72 | 2.66 | 2.71 |

The additional gains occurred when the grass was driest ie. in the first 72 days on pasture. With rain in August and new pasture growth, creep feed consumption declined and control calves gained slightly faster than the creep fed calves. Over the 121 day period, the creep fed calves gained an additional 43 lbs than the control calves. The creep feed costed $9.00 per calf or 21¢ per lb gain. Given last falls calf prices, returns were from 90¢ to $1.00 per lb of gain excluding the cost of the creep feeder and extra labor.

It appeared that suckling calves consuming mature grass will respond to supplemental protein, provided an adequate quantity of grass is present. Work from Oklahoma reinforces this conclusion. The response in this trial was economical. If the 1988 summer continues dry, supplementing sucking calves with protein will also be an economic alternative.

## THE BREEDING SEASON

The breeding season is the time when bull meets cow, bull mates cow and cow gets pregnant. The level of fertility achieved is determined by what happened to those cows in the previous 12 to 15 months. For example:

1. Cows that condition score 2.5 to 3 will likely conceive earlier in the breeding season than thin cows.
2. Cows that calved unassisted will likely conceive earlier than cows that had a difficult birth.
3. Cows that calved late a year ago will likely calve late this year and as such conceive later in this breeding season.

The point being made is that correcting breeding problems such as shortening the length of the calving season requires management, feed resources and time. It is a year round task. We cannot merely pull the bull from the breeding herd after a set date and not pay the price. We must put a plan into place based on objectives and work that plan. For those producers whose objective is to reduce the length of the calving season, the plan will take 2 to 3 years to achieve and may be accomplished in a similiar manner to this:

1. Set objectives 3 years into the future based on today's productivity.

| Productivity | Present | Possible Future |
|---|---|---|
| a) First 21 days | - 40% of cows calve | - 60 to 70% of cows calve |
| b) After day 63 | - 15% of cows calve | - 0% of cows calve |

2. Evaluate production alternatives to achieve these objectives including each alternatives extra cost. These alternatives may include:

    a). heifer replacement program (selecting and feeding)

    b). cow feeding program - extra winter feeding or group feeding
    - improved pastures

    c). bull evaluation - choice of sire type
    - reproductive examination

    d). culling procedures - spring
    - fall pregnancy check

3. Evaluate the cash flow requirements and changes associated with each alternative. For example, if late calving cows are identified and culled, then more replacement heifers will be required which will affect cash flow.
4. Implement corrective alternatives, monitor response and re-evaluate decisions. A record keeping system will be required to ensure valuable information does not get forgotten or lost.

In working this plan, one realizes that a shortened calving season occurs before shortening the breeding season. It is accomplished by having highly fertile cows bred by highly fertile bulls.

AL.1.811

# BEEF 'N' BACON

Alberta
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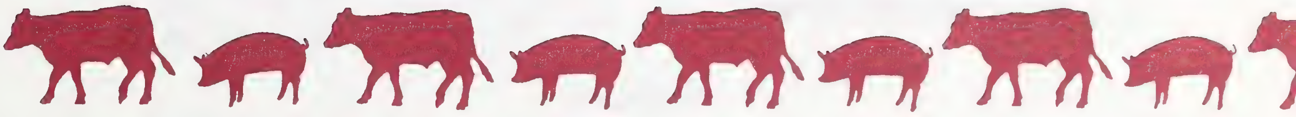

# INTRODUCTION

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# RED MEATS

## CONSUMERS ARE CONCERNED ABOUT FAT IN FOODS

Recent surveys indicate that fat tops the list of consumers' concerns about the nutritional content of the foods in their grocery carts. A popular item in those carts is ground beef. Supermarkets usually carry three types of ground beef: regular (no more than 30% fat), lean (no more than 23% fat), and extra lean (no more than 17% fat).

Once the ground beef has been cooked; regular ground beef contains 19.46 percent total fat, lean contains 17.64 percent total fat, and extra lean contains 15.80 percent total fat.

Eating extra lean ground beef rather than regular ground beef does result in a 9 percent decrease in caloric content, a 10.5 percent decrease in calories from fat, and a 19 percent reduction in total fat including saturated fatty acids.

Recent research has shown that the method of cooking affects the fat levels and final caloric content of meat patties. Of the six different cooking methods analyzed (electric broiling, charbroiling, roasting, convection heating, frying, and microwaving), microwaving produced cooked ground beef patties with the lowest fat and caloric contents.

By lowering the fat and calories from fat, you increase the concentration of the B vitamins, iron, phosphorus, and zinc in the beef consumed. So a change from regular to extra lean ground beef has many beneficial effects.

# REDUCING HOG PRODUCTION COSTS

Most producers have little control over the price received for their hogs. But most producers can do a lot to reduce their costs of production.

## Grower Finisher Costs

With today's feed prices, every finished hog leaving the farm is costing $70-80 in total feed costs (including sow and boar feed). The growing-finishing barn is consuming the majority of feed and feed is the major hog production cost.

## Feed Wastage

Reducing feed wastage is one of the simplest ways of reducing costs with very little effort.

Self feeding is the preferred system, allowing hogs to achieve their fullest genetic potential. Floor feeding results in feed wastage or feed restriction. Either case results in reduced profit and increased cost.

A number of things can be done to reduce feed wastage:

- Consider putting in self feeders if floor feeding.
- Adjust self feeders every day! Make sure feed is coming out the full length of the self feeder. Make sure there is only a thin layer of feed in the trough. A full trough allows rooting of feed, again causing wastage.
- Repair broken or damaged self feeders. Broken self feeders allow feed to escape and can cause injury to hogs.
- Allow enough trough space per hog. Four hogs for every self feeder space is a good rule of thumb.

## Feed Testing

Make sure feed is balanced with proper levels of Lycine (protein), Minerals and Vitamins. If soybean meal or premix is being overfed, the ration is costing more than necessary. If the ration is short a nutrient the hogs do not perform and there is increased cost. Regular testing of Barley and Wheat is needed to ensure a balanced ration is being fed.

## Other Considerations

- Do not overcrowd hogs. Overcrowding means reduced growth rate, higher feed conversions and a reduction in total barn through put. If faced with overcrowding, consider selling weaners, adding on to the barn, or reducing sow numbers.
- Allow free choice water and two nipples per pen. Growing finishing nipples should deliver close to 1 litre per minute.
- Make sure ventilation is adequate. Poor ventilation means poor growth and increased costs.

## Conclusion

Taking care of the little things often results in the big things taking care of themselves. You can't control the price of your product, but you can do a lot to reduce costs.

# FATS OR OILS FOR PIG DIETS

Energy accounts for 70 to 80% of the average pig's diet. Energy is the most expensive nutrient representing 60 to 70% of diet cost. Grains which are high in carbohydrates supply about 65% of the energy, protein supplies about 25% while the remaining 10% is supplied from fats and oils.

Pigs require energy for body maintenance, growth, reproduction and other vital body processes. Fats and oils are an excellent energy source with a value 2.25 times that of carbohydrate sources. Adding fats or oils to pig diets costs money. Before incorporating additional fat or oil in pig diets, it is vital that producers evaluate both the usefulness and cost effectiveness of these products.

## PRODUCT ALTERNATIVES

Fats and oils are made up of saturated and unsaturated fatty acids plus glycerol. Pigs have a requirement for certain unsaturated fatty acids. Animal fats contain 40 to 50% unsaturated fatty acids while commonly available oils are made up of 80 to 90% unsaturated fatty acids. Several product alternatives are available as shown in the following table. Although significant differences exist in nutritional value between brands, more user-friendly powdered dry fat products are becoming increasingly available.

| | DE* (kcal/kg) | Approximate Digestibility | Melting Point |
|---|---|---|---|
| FATS | | | |
| yellow grease (feed grade) | ** | 80% | solid at room temperature |
| white grease (pork lard) | 7860 | | |
| tallow (beef fat) | 8200 | | |
| poultry fat | 8640 | | |
| OILS | | | |
| soybean oil | 7560 | 87% | liquid at room temperature |
| corn oil | 7620 | | |
| canola oil | ** | | |
| sunflower oil | ** | | |

* NRC, 1988 ** use value of similar product

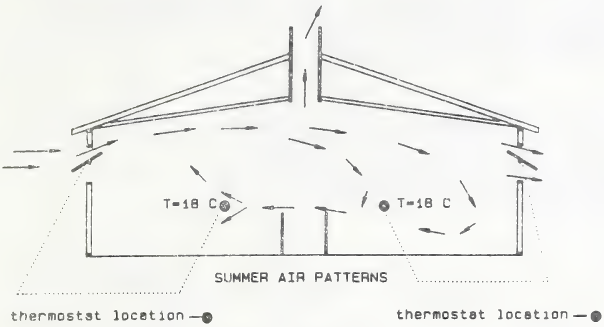
## BENEFITS FROM ADDED FAT

Research has shown that:

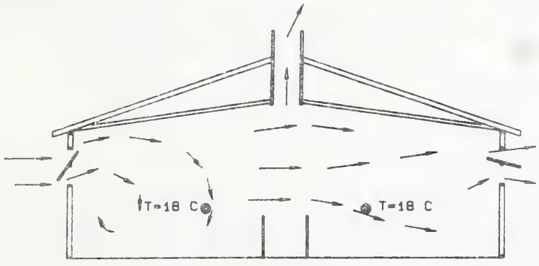
- adding 5 to 8% fat or oil to starting diets will increase energy intake, reduce body fat loss and increase growth rate. For every 4% fat added increase the protein content of the diet by 1%.
- adding 5% fat or oil to growing-finishing diets will increase growth rates by 3% and feed efficiency by 10%. Increases in backfat and poorer grades can occur. Under warm environmental conditions (35°C) the addition of 5% fat to feeder pig diets will stimulate feed intake and allow pigs to maintain normal growth rates.
- adding 7.5% fat to sow rations 7 to 10 before farrowing and one week after will increase pigs weaned by 0.3 pigs per litter. Adding 4 to 5% fat to nursing sow diets will increase energy intake by 6 to 7% and improve reproductive performance. Protein content of the diet should be increased by 1%.
- adding 5% fat reduces feed dust by at least 50%. Adding only 2.5% reduces feed dust by 25%. Routinely, 1 to 2% has been found to be effective in reducing feed dust and prolonging equipment life.

(Source: based on Aherne, 1988.)

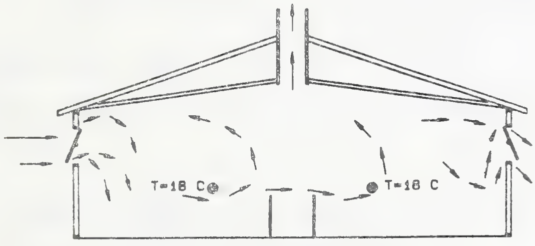
# THERMOSTAT LOCATION AND ADJUSTMENT FOR NATURALLY VENTILATED BARNS



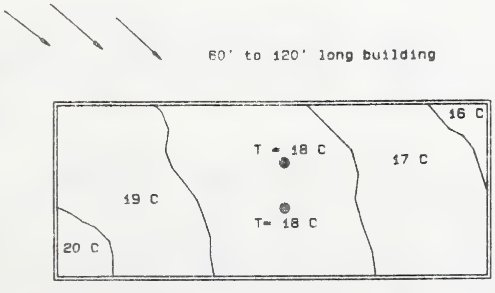
SUMMER AIR PATTERNS



SPRING AND FALL AIR PATTERNS



WINTER AIR PATTERNS



WINTER TEMPERATURE ZONES

## LOCATION

Thermostats should be located as close as possible to the pig's comfort sleeping zone. The best location is 10 to 12 feet from each side wall (3-4m) and 3 to 4 feet above the floor (.9-1.2m). Protect the thermostat from the pigs. For buildings less than 120 feet long, locate one thermostat per side half way down the building.

## TEMPERATURE

The optional zone for finishing pigs is 17-19°C (18°C = 65°F).

## ADJUSTMENT

Using the minimum ridge concept,the ridge is controlled manually. Set the ridge to a minimum, about a 1/4" or 6 mm crack in the winter. The side doors are controlled by thermostats set to exactly the same temperature (18°C) to avoid temperature fluctuations.

## SUMMER

(Above 20°C) Thermostat location is not critical as temperature is uniform. Open ridge.

## SPRING AND FALL

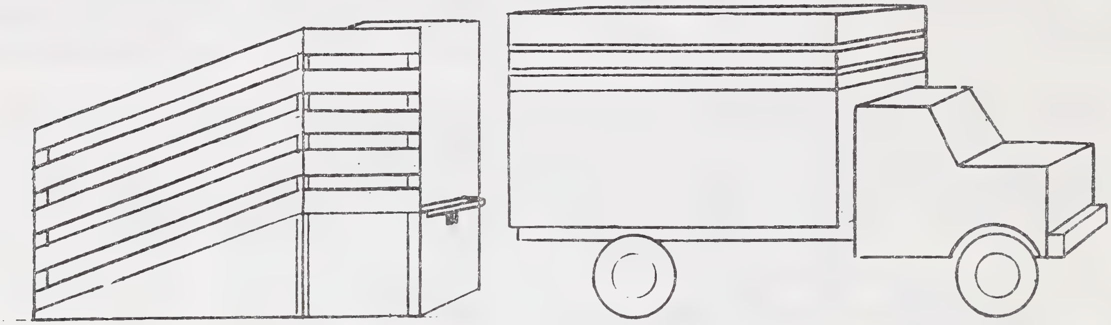
(5°C to 20°C) Locate the thermostat to catch the falling air. Manual ridge control.

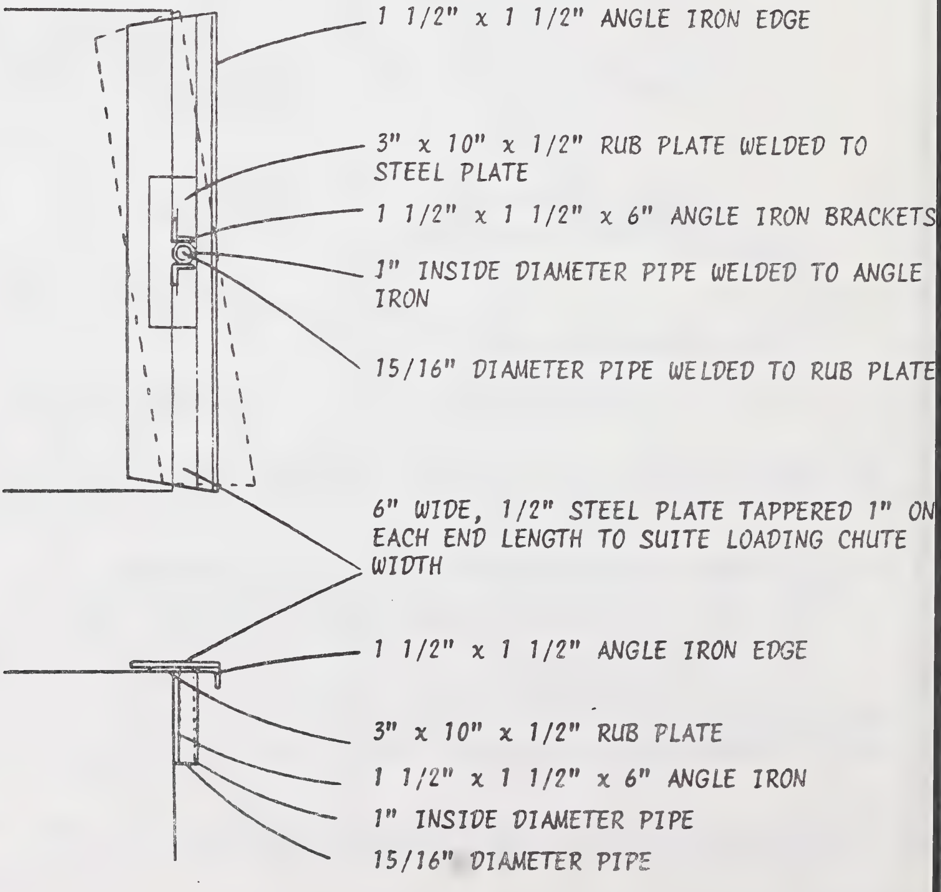
## WINTER

(less than 5°C) Locate the thermostat to maintain a comfort zone in the sleeping area. Minimum ridge opening.

# SWIVEL BUMPER FOR LOADING CHUTE

There are several farms which have utilized this idea on their loading chutes. Not only does it minimize the frustration of backing up squarely to the loading ramp, but it also prevents animal injury.




1 1/2" x 1 1/2" ANGLE IRON EDGE
3" x 10" x 1/2" RUB PLATE WELDED TO STEEL PLATE
1 1/2" x 1 1/2" x 6" ANGLE IRON BRACKETS
1" INSIDE DIAMETER PIPE WELDED TO ANGLE IRON
15/16" DIAMETER PIPE WELDED TO RUB PLATE
6" WIDE, 1/2" STEEL PLATE TAPPERED 1" ON EACH END LENGTH TO SUITE LOADING CHUTE WIDTH
1 1/2" x 1 1/2" ANGLE IRON EDGE
3" x 10" x 1/2" RUB PLATE
1 1/2" x 1 1/2" x 6" ANGLE IRON
1" INSIDE DIAMETER PIPE
15/16" DIAMETER PIPE

# PROCESSING & STARTING NEWLY WEANED CALVES

Each year at about this time cattle producers begin the rites of fall which includes the sorting, processing and movement of weaned calves. The selling of weaned calves is the culmination of one production cycle for many cow/calf producers. For those who retain ownership or purchase calves, it is the beginning of another cycle.

Newly weaned calves must get the best start possible. Weaning is a stressful time for calves and can be reduced if the calves are eating solid feed and drinking the necessary water. Weaning stress can be further minimized by incorporating common health practices both before and after weaning.

Dan McKinnon, a successful feeder in the Airdrie area, has a program which works well and could be adapted to other operations. There are many others that have equally successful programs, but Dan's is illustrated as an example. His health program includes:

THREE WEEKS PRIOR TO WEANING

- 7 or 8 way vaccine
- IBR/PI3 intranasal
- ITEME
- Warble control
- Deworm (optional)
- Implant (if not intended for breeding)

AT WEANING

- Booster IBR/P13
- Booster ITEME

If the calves were bought unprocessed, Dan follows the same procedure as 3 weeks prior to weaning, plus immediate off loading of calves from the truck. Three weeks later IBR/PI3 and ITEME boosters are administered.

Feeding is critical. Provide a minimum 16" of bunk space per calf to enable all calves to eat at one time. The first feed is long stem hay both in the bunk and on the ground for ranch calves. Be sure calves find the waterer.

After 2-4 days a 30% grain, 10% supplement, 60% cut hay ration is fed with 5 lb. salt added/ton of ration. If not feeding a complete ration, mix salt in the grain to allow approximately one half to three quarters of an ounce of fortified trace mineralized salt/head/day.

After 4-8 days silage can be incorporated if available and fed as a complete ration at 20% grain, 20% silage, 6.5% supplement and 53.5% cut hay with salt at 4 lbs/ton.

Up to 3 weeks later the ration can be altered to provide 20% grain, 50% silage, 5% supplement and 25% cut hay plus salt at 2 lb/ton complete ration. All rations are reported on an as fed basis.

If silage is not available, continue to feed good quality hay. Your Feed Company, Regional Livestock Specialist or District Agriculturist can provide more precise and individually tailored ration recommendations for your farm.

Dan further states that he beds only when the weather is wet. Freshly weaned calves will eat straw and will not learn where the feed is located if bedding is present.

It is important to walk the pens at least twice per day for the first month. Pull all sick or suspect calves and take temperatures on all the pulls. Calves in the sick pen should have their temperatures taken every day and treated for a minimum 4 days or at least 2 days if no temperature is present. Keep records and use them to evaluate your treatment program. Work with your veterinarian and do post mortems on all deads.

This program has worked well for Dan and could be structured to fit any feeder's operation. There is no single method that works all the time, but working with professional resources (veterinarians and nutritionists), will lead to a successful feeding program for newly weaned calves.

# COMPARING SELLING ALTERNATIVES

Remember the saying "Compare Before You Buy", well the reverse, "Compare before you Sell" is also true.

The following table illustrates two methods of marketing calves. Both methods are popular in Alberta. The table illustrates a potential increased net return of $10.00/calf for the 'on farm' method of selling. This potential extra return is calculated using a price 4¢/lb less than that received at an auction and using a 3% difference in shrink. The variations at the bottom of the table show the net return at varying levels of shrink or at an equivalent price per lb.

An important strength for selling directly off the farm is that stress can be minimized and as such, the buyer receives strong, healthy calves. In fact, feedlot buyers may be willing to pay price premiums for farm direct calves.

Auction vs On Farm Selling of Calves*

| Auction | | On Farm |
|---|---|---|
| 600 lbs @ 6% shrink = 564 lbs. | | 600 lbs @ 3% = 582 lbs |
| 564 lbs @ $1.00 | = $564.00 | 582 lbs @ $0.96 = $558.72 |
| Commission | 15.00 | ---- |
| Hartford Insurance | 1.29 | 1.29 |
| A.C.C. | 1.50 | 1.50 |
| Brand Inspection | 0.50 | 0.50 |
| Trucking | 10.00 | 10.00 |
| Net Return | $535.41 | $545.43 |
| @ 5% shrink = $541.41 | | @ 4% shrink = $539.67 |
| @ 4% shrink = $547.71 | | @ $1.00/lb = $568.71 |

* Source: B. Scheideman, 1988 Alberta Beef Symposium Proceedings.

But on farm selling of calves is not a clear cut alternative. There are some problems which must be discussed.

1. What are the calves worth. Auction markets have competitive bidding which sets the price. On the farm, it is difficult to get more than 1 or 2 bids, so one may not be sure what the cattle are actually worth.

2. Can the producer accurately assess the animal weights so that he is on the same basis as the buyer. A producer must confidently know which weight category his animals are in; a farm scale may be required.

3. Market knowledge. Radio reports tend to give the higher prices. As a seller, you will need to view several calf sales both before and after selling your calves, firstly to determine approximate value and secondly to asses your decision.

4. Understand shrink. Pencil shrink adjusts animal weights for gut contents. The percent pencil shrink will be different for calves either weighed on the farm, after a 75 km truck ride, or a 300 km ride and weighed the following morning.

5. Is the buyers cheque any good. Licensed livestock dealers are required to be bonded. However, for sales to other individuals, have the buyer sign a "conditional sales contract" which specifies that until payment is received in full, the seller retains ownership.

6. Accept that your calves were worth what the buyer paid. If you did your homework, you will likely have received market value and perhaps saved some shrink or market commissions, yielding a higher net return.

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# BEEF'N' BACON

Alberta
AGRICULTURE

NOVEMBER 1988 VOL. 4, NO. 2

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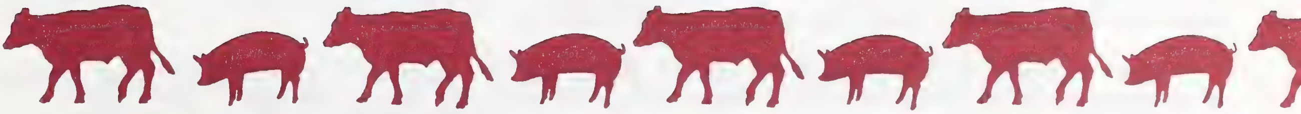

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# RED MEATS

## NEW MICROWAVE COOKING INSTRUCTIONS FOR MEAT

The microwave oven is being adopted by consumers as a means for achieving the fast, up-beat lifestyle of the 80s. Today "microwavable" is one of the latest buzzwords. Microwave cooking is cool and quick. Many, however, hesitate to microwave roasts of meat because they think the meat does not brown. However, microwaved roasts not only brown, they usually cook faster, shrink less and are juicier.

Recommendations for microwaving meat have changed. The majority of meat cuts should be microwaved at 30 to 50 percent power instead of 100 percent power as previously recommended. The use of low power in comparison with high power microwave cooking, has been found to increase the flavor and tenderness of the meat. A less tender cut of meat cooked at lower power in a microwave can yield a product comparable with that obtained by conventional cooking. Roasts of meat that were frozen and cooked on low power were comparable to those cooked conventionally from the standpoint of flavor and tenderness. Because of the long cooking period, these roasts were also brown.

The newer microwaves have a pulsing feature permitting the power to be set so that it goes on and off continuously. The off-cycle allows the heat to be evenly distributed throughout the food. Automatically pulsed heating requires less preparation time and was more energy-efficient than the manual on-off method.

Beef rib eye roasts cooked by either the manual or automatic pulsed microwave method were comparable in juiciness and flavor to conventionally cooked roasts.

The advantages of microwave cooking are the convenience and the saving in energy while still being able to prepare meat that compares favorably to conventional methods.

# REDUCING HOG PRODUCTION COSTS

Most producers have little control over the price received for their product. But most producers can do a lot to reduce their costs of production.

## WEANER HOG COSTS

Reduced growth rate and poor feed efficiency in the weaner barn is where most producers are losing ground. But the weaner pig up to 80-90 pounds has the potential to gain very quickly with very little feed. This period from weaning to 90 pounds can be the cheapest growth, but is often the stage where producers lose most of their days. Taking advantage of this accelerated period of growth is the best way of reducing costs in the weaner and early grower stage.

## FEEDING THE WEANER

It is very important to get the newly weaned hog started on solid feed as soon as possible after weaning. Going straight from mothers milk to a cereal based diet is stressful and can mean the pig grows very little the first week after weaning. So how do we wean a pig with the least stress and keep them growing?

- Do not wean pigs that are less than 12 pounds (5 kg). With poor weaner facilities the minimum might be 16 or more pounds.

- Be flexible when weaning. Wean some of the stronger pigs earlier to give the smaller pigs a boost. Do not wean strictly by age but pay attention to the strength of the pigs. Many pigs shouldn't be weaned before 5 weeks because of the harsh environment they are weaned into.

- Wean pigs onto a hog starter that is very digestible with a lot of milk based products. Feed this product for the first week or two until the pigs reach 25 to 30 pounds. They can then be put on a home mixed wheat based ration or a purchased 18% starter.

- Feed small amounts, often, for the first few days after weaning. An open trough that allows all the pigs to eat at once works very well. Once they are eating well, the self feeder can be used. Only put enough in the self feeder for 1/2 or 1 days feeding. This will ensure the feed staying fresh and not picking up odors.

- Provide free choice water with one nipple for every 10 pigs and two nipples per pen. The flow rate should be .8 cups per minute or .25 litres per minute.

- Electrolytes and/or sugar water can be provided to boost energy intake and reduce stress.

## CONCLUSION

Farm for the least privileged pig and the other pigs will naturally have their needs met. You can't control the price of your product, but you can do a lot to reduce costs.

# GIVE PIGS POSITIVE STROKES

In modern confinement pig operations there is considerable opportunity for close interactions between people and pigs. These interactions result in complex social relationships being established between pigs and the people that care for and handle them. Observations in commercial units show there is a wide range in the quality of this human-animal relationship. At the lower end of the range, pigs are highly fearful of humans, are reluctant to approach them, and are continually under chronic stress.

## POSITIVE HANDLING PAYS

Being nice to pigs pays. Research in Australia has found that the way in which the stockperson handles the pigs has a significant effect on the level of fear pigs have. Studies of 12 very similar one-man pig farms found that productivity was poorer on farms where pigs were more fearful of humans. The major underlying difference between these farms was identified to be the stockperson.

Aversive or rough handling (slapping, kicking, or shocking) can affect pig behavior and productivity. The following table illustrates that when pigs are subjected to rough treatment their fear of humans increases. As a result, growth rate in young pigs is depressed and reproductive performance in adult pigs is reduced.

EFFECTS OF HANDLING TREATMENT ON PIG FEAR AND PRODUCTIVITY

| | PLEASANT CONTACTS | MINIMAL CONTACT | AVERSIVE CONTACTS |
|---|---|---|---|
| Time to interact with person (sec.) | 10 | 92 | 147 |
| Growth rate from 7-13 weeks (g/day) | 455 | 458 | 404 |
| Time to interact with person (sec.) | 48 | 96 | 120 |
| Pregnancy rate of gilts (%) | 88 | 57 | 33 |

(Hemsworth et al 1986,1987).

## POINTS TO NOTE

- Make sure facilities are in proper repair and are conducive to easy handling. Getting frustrated over poor equipment and facilities is often taken out on the pigs.
- Maximize the number of positive interactions (pats or strokes) with your pigs. Regularly monitor the level of fear of humans by observing the withdrawal response of pigs to you or your employee's approach.
- Encourage everyone in the unit to handle pigs positively. Research has shown that frequent bouts of positive handling do not mask or negate the adverse effects of a few bouts of aversive handling.
- Hire sensitive and conscientious stockpeople. Select them on the basis of their attitude. Test their pig handling skills before offering them the job.

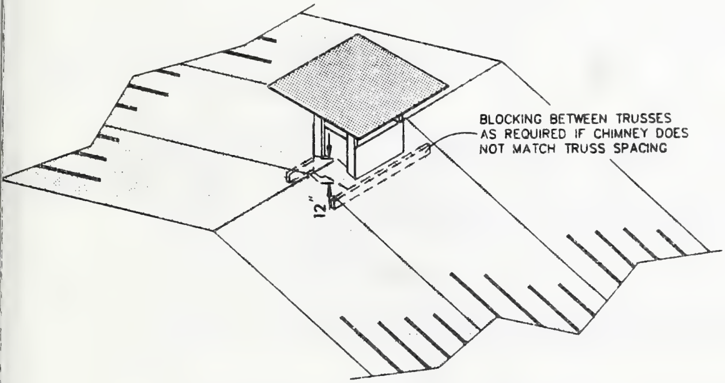
# CHIMNEYS FOR NATURAL VENTILATION BARNS

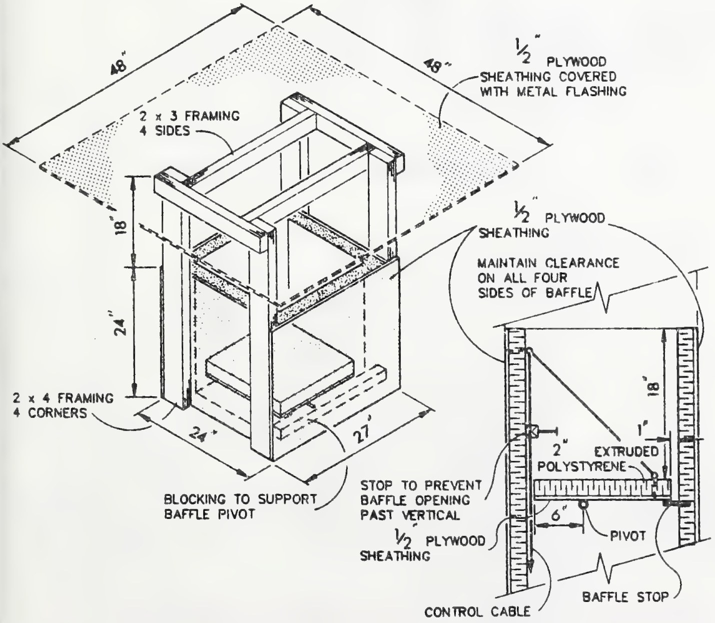
- The Minimum Ridge Concept

Conventional naturally ventilated barns have ridge vents ranging from 6" to 24" wide. An alternative to wide ridge vents is smaller ridge openings or chimneys. Environmental control is easier, structural problems are reduced and construction and equipment costs are less.

## Structural Problems

Scissor trusses using conventional ridge vents may have the top joint exposed to damp ventilation air. Shrinkage and swelling of wood due to moisture changes results in truss plates working their way out of the wood. Also, galvanized steel truss plates exposed to rain, ventilation air, and barn gases corrode rapidly.


BLOCKING BETWEEN TRUSSES AS REQUIRED IF CHIMNEY DOES NOT MATCH TRUSS SPACING
12"


48"
48"
1/2" PLYWOOD SHEATHING COVERED WITH METAL FLASHING
2 x 3 FRAMING 4 SIDES
18"
24"
2 x 4 FRAMING 4 CORNERS
24"
27"
BLOCKING TO SUPPORT BAFFLE PIVOT
1/2" PLYWOOD SHEATHING
MAINTAIN CLEARANCE ON ALL FOUR SIDES OF BAFFLE
18"
1"
2" EXTRUDED POLYSTYRENE
6"
PIVOT
STOP TO PREVENT BAFFLE OPENING PAST VERTICAL
1/2" PLYWOOD SHEATHING
CONTROL CABLE
BAFFLE STOP

## Chimneys

A conventional 40 ft wide feeder barn may be ventilated with large side doors and chimneys spaced every 24 ft. Each chimney is 2 ft x 2 ft, insulated with 2" of styrofoam, and controlled with a rotating styrofoam baffle. The baffle is opened by hand using a control wire. If the wire breaks the baffle is pivoted off centre so that the baffle closes automatically. In the closed position there is a 1 in gap left on all four sides to prevent total closure and freezing problems. The effective opening is 200 square inches open and 70 square inches closed.

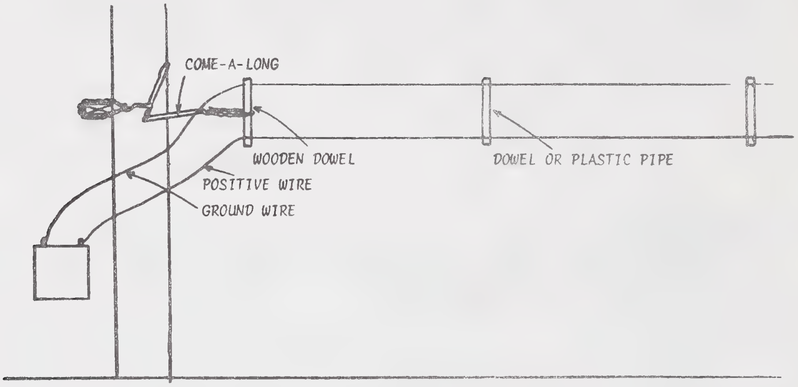
## Winter Management

The chimneys are operated by hand, while the side doors are opened by automatic controls.

| Outside | Side door Thermostats | Chimney |
|---|---|---|
| intermediate (20°C to 5°C) | on | open |
| cold (less than 5°C) | on | closed |
| extremely cold - 30° C) | off | closed (minimum opening around baffle controls moisture) |

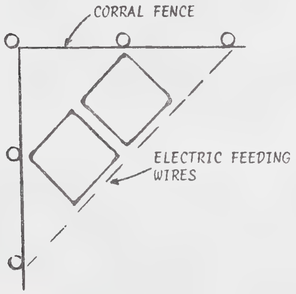
# ELECTRIC WIRE FEEDING

Electric wire feeding is very versatile with the limiting factor being the availability of power. Two wires across the feeding face is preferable. The wires are 6" to 8" apart and can be held apart by either stapling the wire to a short wooden board; by drilling holes in a 1" wooden dowel or by drilling holes in a short piece of garden hose. The wires are placed at waist height. The top wire is usually the ground wire and the bottom the hot wire. The wires can be either barbed, high tensile wire or posishock wire. The wires are secured on each side to a corral fence or series of posts. A small come-a-long at one end is used to keep the wire taunt.

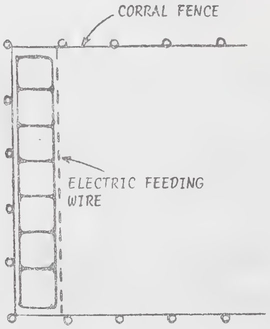

COME-A-LONG
WOODEN DOWEL
DOWEL OR PLASTIC PIPE
POSITIVE WIRE
GROUND WIRE

Here are some diagrams showing the versatility of electric feeding.

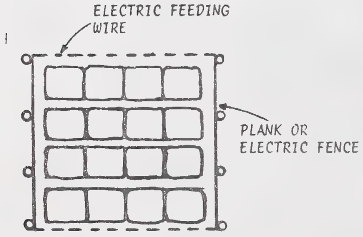
1. IN CORRAL CORNER


CORRAL FENCE
ELECTRIC FEEDING WIRES

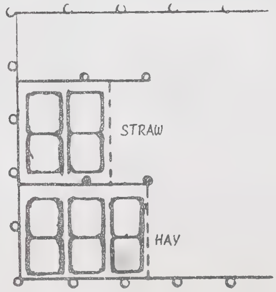
2. ALONG SIDE OF CORRAL


CORRAL FENCE
ELECTRIC FEEDING WIRE

3. IN MIDDLE OF FIELD (ENERGIZER REQ'D)


ELECTRIC FEEDING WIRE
PLANK OR ELECTRIC FENCE

4. WITH DIFFERENT FEEDSTUFFS



# BEEF SURVEY

As extension people we often have difficulty determining the needs of our clients. With this in mind the Red Deer Region of Alberta Agriculture, which takes in North Central Alberta, tried an innovative approach in needs assessment.

Targeting cow/calf producers a survey was sent to approximately 5,500 of them in early 1988. Questions were primarily production related and ranged from herd size to nutrition, breeding, calving and herd health. Due to a strong effort from district offices approximately 3,000 producers responded to the survey. These producers represented just over 200,000 cows and replacement heifers with an average land base of 840 acres and an average herd size of 70 breeding females.

Statistics were broken down by herd size, (1-10, 11-30, 31-50, 50-100 & over 100,) operation type (commercial, purebred or both), and farm type (mixed (beef/grain) or beef only).

Many interesting points came out of the survey which will help Alberta Agriculture district and regional staff set program plans for 1988 - 89 and coming years. Some concerns which must be addressed are:

1. **Length of calving season** - The average length from the survey was 108 days. If the average cow has a heat cycle every 21 days this represents approximately 5 cycles. It is generally recommended the calving season not exceed 63 days as economic loss can become quite significant due to decreased weaning weights.

2. **Death loss** -primarily at or near calving. The survey showed a 6.2% average death loss with 75% of these occurring within 14 days of birth.

3. **Open cows** - very few producers pregnancy test their cows and as such do not have a good handle on their herd relative to open cows in the fall. This can be costly since cull cow price increases from fall to spring may not be sufficient to cover winter feed costs.

Many of the production concerns relate back to basic management such as:

- care of replacement heifers
- three year olds (first calf heifers)
- beef cow nutrition
- bull evaluation
- sire selection
- facilities
- herd health

Producers who responded to the survey will be sent an individual report which compares them with other producers in their district. Also, there will be suggestions as to what, if any, production practices should be looked at more closely, and possibly changed.

Individual contact and small discussion groups could then be used to get more fully into the real needs and concerns of the cattle producers. Alberta Agriculture is committed to the farmers and agriculture producers in Alberta and by better understanding your individual farm we can better serve you.

# PRICING CEREAL SILAGE

There are several methods for pricing silage. The method of choice will depend upon whether the silage will be fed for energy reasons as in a feedlot or for energy plus protein reasons as in a dairy or calf rearing program. The following method prices silage based on the ratio of grain to straw in the silage which in effect is an energy estimate. This calculation reflects a silage price at the silage pit.

A feed analysis is always useful for assessing silage moisture and energy values. However, if an energy analysis is not available, the following method is acceptable.

## Step. 1 - Estimate The Ratio of Grain to Straw.

The composition of cereal silage ranges from 45 to 55% of either grain or straw, with the average being about 50%. There are differences in varieties. With barley for example, the longer straw varieties such as Bonanza, Johnson, Argyle, Empress or Jackson contain from 45 to 50% grain. The medium maturity barley varieties such as Leduc, Hartland or Otal contain from 48 to 52% grain. The newer semi-dwarf varieties such as Samsom, Duke, or Winchester contain from 50 to 55% grain. Oats usually have a lower ratio of grain to straw than the barley varieties.

## Step. 2 - Determine Grain, Straw & Silage Moisture Content and Price.

For example:

| | $/Tonne | % Moisture | % Dry Matter(DM) |
|---|---|---|---|
| Barley | $108 (F.O.B. Farm) | 12% | 88% |
| Straw | $ 18 (F.O.B. Farm) | 15% | 85% |
| Silage | ? | 65% | 35% |

Note: % DM = 100 - % moisture

## Step. 3 - Insert Values in Formula.

$$\text{Silage Value} = (\$/\text{tonne})\ \%\ \text{DM} \times \left( \frac{\%\ \text{barley} \times \text{barley price}}{\%\ \text{DM in barley}} + \frac{\%\ \text{straw} \times \text{straw price}}{\%\ \text{DM in straw}} \right)$$

Note: % barley and % straw must add up to 100%

Using our example, for barley silage containing 65% moisture, the value of the silage would be:

$$\text{Silage value} = 35\% \times \left( \frac{50\% \times \$108.00}{88\%} + \frac{50\% \times 18}{85\%} \right)$$

$$= .35 \times (61.36 + 10.59) \text{ or } = \$25.18/\text{tonne as fed}$$

Given the assumption listed under the table, this table summarizes silage prices for several barley prices at 2 silage moisture levels.

Silage Prices ($/tonne)

| | | Barley Price $/tonne | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 80 | 90 | 100 | 110 | 120 | 130 | 140 |
| Silage | 60% | $22.40 | $24.70 | $27.00 | $29.20 | $31.50 | $33.80 | $36.00 |
| Moisture | 65% | $19.60 | $21.60 | $23.60 | $25.60 | $27.60 | $29.60 | $31.50 |

Assumptions
1. Silage contains 50% straw, 50% barley
2. Straw moisture = 15%, price = $18.00/tonne
3. Barley moisture = 12%

AL.1.811

# BEEF 'N' BACON

Alberta AGRICULTURE

DECEMBER 1988 Vol. 4, No. 3

JAN - 9 1989

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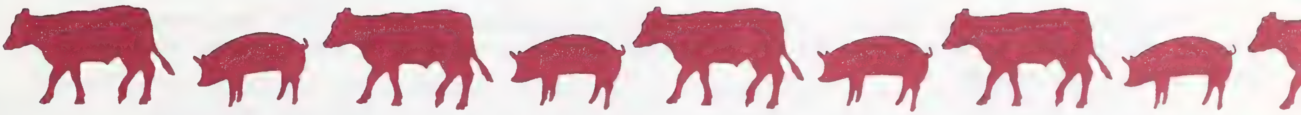

## INTRODUCTION

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# RED MEATS

## CHOOSE QUALITY + PREPARE PROPERLY = DELICIOUS EATING

Top quality pork is firm and fine grained. Color is also an important indication when buying pork. A normal light pink color is most desirable. The outer fat covering should be firm and white. The amount of bone in relation to meat is small. Bones are porous and slightly pink in color.

The tenderness of pork roasts and chops is a major source of appeal to pork lovers. Because animals are young when processed, pork is naturally tender. The texture or surface appearance of meat is an indication of tenderness; the coarser the texture, the less tender the meat.

Follow the rule "low and slow" when cooking pork to ensure its tenderness and the best in eating quality. Excess cooking will dry the meat out resulting in it being tough. However, if you cook it so that there is a tinge of pink or when the meat thermometer registers 80-85$^{o}$C, the meat will be juicy and full of flavor.

Like all meats, fresh pork must be properly handled to maintain quality. Fresh, cooked and cured pork should be stored in a refrigerator at 4$^{o}$C as soon as possible after purchase.

Freezing preserves flavor, color and nutritive value of pork. For best results, use frozen fresh pork within three to six months. Frozen ground pork and sausage should be used within two months.

# REDUCING WEANER HOG PRODUCTION COSTS

Pigs can put on one pound of body weight for less than 2 pounds of feed in the weaner barn. In order to achieve low feed conversion, pigs need the proper environment with the least stress.

## TEMPERATURE

Because of the stress associated with weaning, the temperature should be raised when pigs are first put in the nursery. With all-in, all-out systems, the whole room temperature can be raised. With continuous flow weaner barns, other methods can be used.

Heat lamps above the pen can raise the temperature for the newly weaned pig. Another method is using a piece of plywood as a lid at the back of the pen. One producer with totally slatted floors uses a piece of plywood on the bottom and the top for the first week. He removes the floor for the second week and removes the roof for the third week.

Temperature at pig level should be between 80-83 degrees Farenheit for the first week. The temperature should be dropped around 2 degrees a week until the pigs leave the barn.

The real temperature the pig experiences depends on air movement, dampness, floor type, feed intake, bedding etc. Let the pigs tell you if they are comfortable by the way they lie.

## CROWDING

Pigs weaned on to total slats should have 2.5 square feet per pig. Pigs on partially slatted floors should have 3.5 square feet per pig. Weaner pens should be small, with 10-15 pigs per pen if possible. Crowding causes stress and reduced growth rate.

## ALL-IN - ALL-OUT

AIAO production refers to removing a group of animals, washing the facilities and putting in a new group. AIAO usually refers to a system of rooms, but in a general sense can refer to individual pens being emptied, washed and filled.

AIAO production has several advantages.

- It allows the removal of the source of infection from the environment.
- It removes the pigs from the contaminated environment.
- It increases the immunity of the pigs.
- Stress is reduced in a room system because temperature, air speed and the pigs themselves can be more closely monitored.

## MEDICATION

Young hogs are the most responsive to feed medication for the purpose of growth promotion. A 10-15% improvement in growth and a 5-10% improvement in feed conversion can be expected in young pigs. In a test at the U. of Saskatchewan, involving minimum disease pigs, the medicated group grew 27% faster, consumed 20% more feed per day and required 6% less feed per unit of gain.

## CONCLUSION

Other considerations are ventilation, feeding, breed, the human factor and others. Remember, if you farm for the least privileged pig, the other pigs will naturally have their needs met. You can't control the price of your product, but you can do a lot to reduce costs.

# VALUE OF SWINE WASTE

Swine manure is a rich source of major plant nutrients. The value of swine manure as fertilizer to provide crops with additional nitrogen, phosphorus and potassium is well recognized. The nutrient content of swine manure varies considerably. Several factors influence the nutrient value from the time it is collected, stored, and applied on the land:

- composition of ration fed
- collection and storage conditions
- soil characteristics and crop grown
- amount of feed and water spillage
- time and method of application
- climatic variables, particularly temperature

## DETERMINING NUTRIENT VALUE

Precise determination of manure nutrient content is very difficult as it continually undergoes biological and chemical changes. Dilution by water spillage into pits or rain into lagoons reduces its fertilizer value. Further, exposure to the sun or wind can significantly increase nitrogen losses.

Minimizing nutrient losses is essential. Recent work has shown that nitrogen losses in lagoons can be controlled by reducing the surface:volume ratio, using subsurface inlets to reduce surface disturbances and providing wind protection to reduce wave action. Regardless, it is recommended that if an accurate fertilizer value is to be determined manure samples should be analyzed regularly. Assuming normal nutrient losses testing has shown that on average liquid swine manure contains 0.35% nitrogen, 0.25% phosphorus ($P_2O_5$) and 0.20% potassium ($K_2O$).

## WHAT IS MANURE WORTH?

Application rates must be determined and are affected by such factors as soil type, croppin practices, and application methods. Assuming an average application rate of 4,500 gallons of liquid manure per acre (weighing 10 pounds per gallon) the following table illustrates what manure may be worth.

| | NUTRIENT CONTENT (%) | AMOUNT APPLIED (lbs) | AMOUNT AVAILABLE* (lbs) | COST ($/lb) | VALUE ** ($/acre) |
|---|---|---|---|---|---|
| Nitrogen | 0.35 | 157.5 | 78.8 | 0.22 | 17.34 |
| Phosphorus ($P_2O_5$) | 0.25 | 112.5 | 56.3 | 0.30 | 16.89 |
| Potassium ($K_2O$) | 0.20 | 90.0 | 45.0 | 0.15 | 6.75 |
| | | | | TOTAL | $40.98 |

* 50% available during year 1; 95% used by year 3.

** does not include application or transportation costs

## POINTS TO REMEMBER

- Additional value of manure in improving soil structure, water holding capacity, and root and moisture penetration must also be considered.
- Avoid nutrient build-up in soil. Keep good records on fields.
- Maximize nutrient value by thorough agitation, and uniform application of manure Avoid spreading on frozen ground.
- Use good safety measures when handling manure.

# VENTILATING SMALL ROOMS

Small rooms with 50-60 weaner pigs or 4-6 sows are difficult to ventilate. Two problems that arise are:

1. Although summer fans are available, fans small enough for the stage 1 winter ventilation rates are few.
2. Conventional air inlets do not work well in the winter.

Adding a recirculation duct that stirs the air in the room and also exhausts the minimum winter ventilation rate is one solution to these problems.

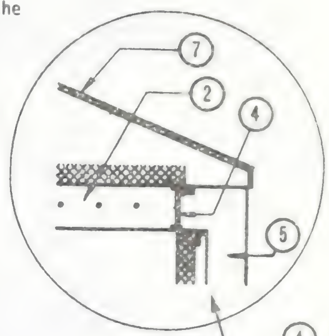
① Recirculation fan.

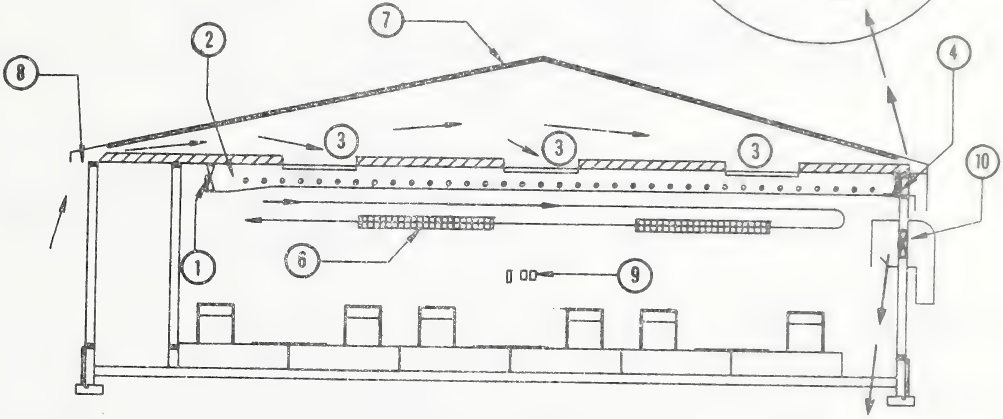
② Recirculation duct with air holes.

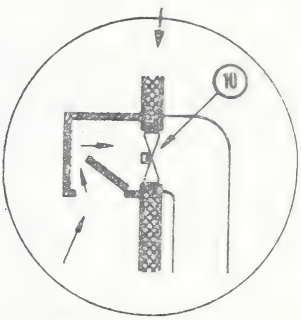
③ Fresh air inlets (4 ft long) from attic

- counter balance inlets.

④ Sliding door to control minimum exhaust ventilation.







⑤ Outside weather hood to below mid height of wall, 4 inches from wall.

⑥ Hot water finned tube heating.

⑦ White roof with plastic-faced roll blanket insulation to prevent high attic temperatures.

⑧ Attic vented through soffits. Six inch flaps open in the summer, one inch slot for winter.

⑨ Thermostats with max/min thermometer.

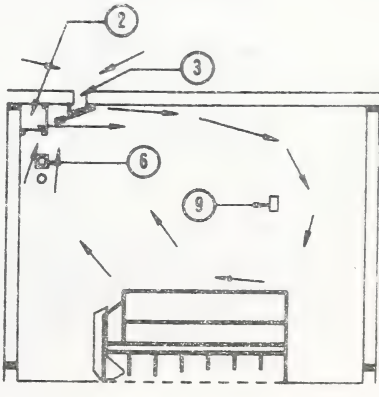
⑩ Exhaust fan with winter backdraft control box (remove box in summer)

## DESIGNING THE SYSTEM

Recirculation

Size the recirulation duct and fan for an airflow of .08 cfm per cubic foot of room volume plus 1.5 times the minimum ventilation rate.

| DUCT SIZES | AIRFLOW | NUMBER OF HOLES<br>1¼" | <br>1½" |
|---|---|---|---|
| 12" x 9.5" | 470 cfm | 60 | 42 |
| 12" x 12" | 600 cfm | 78 | 54 |
| 16" x 9.5" | 630 cfm | 82 | 57 |
| 16" x 12" | 800 cfm | 104 | 72 |

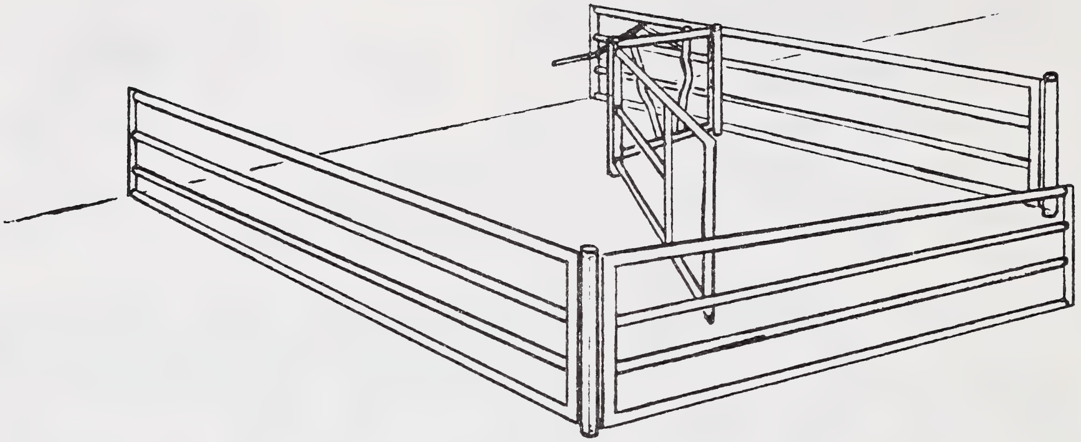


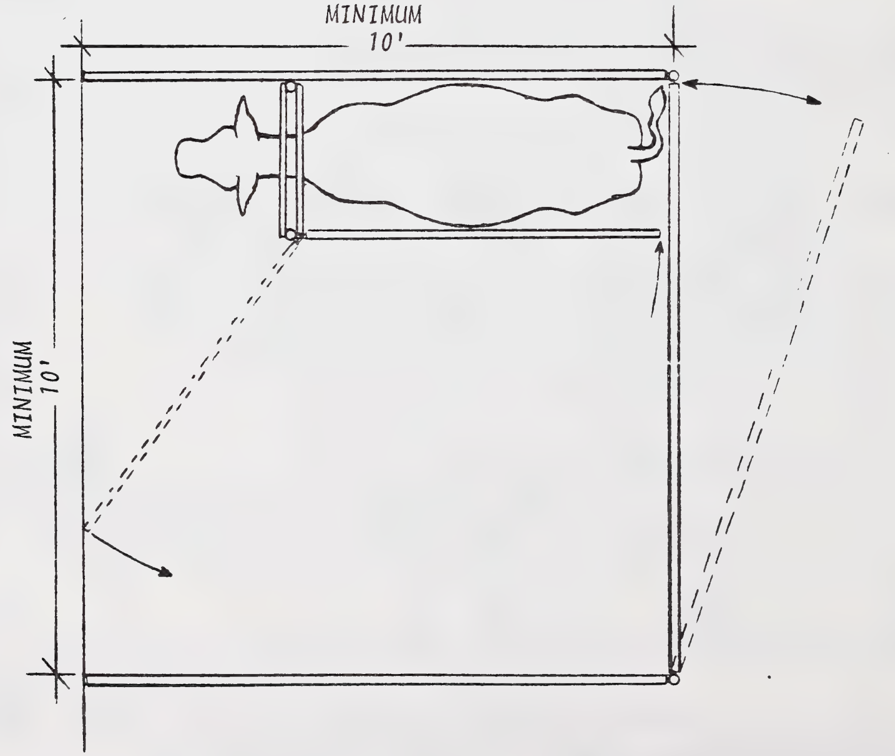
Control

Adjust the sliding door (number 4 on the drawing) to just exhaust enough room air to equal the minimum ventilation rate. A manual variable speed recirculation fan will give the system more adjustment. During warm winter days the exhaust fan may start and draw air through the winter back draft control box.

# CATTLE TREATMENT PEN

This pen can be located in a calving barn or in a part of the handling corrals and used for calving, nursing or treating individual animals.




MINIMUM
10'
MINIMUM
10'

# FEED ADDITIVES FOR FEEDLOT ANIMALS

There are a number of products designed to improve feed efficiency of feedlot animals. Improved feed efficiency is critical for feedlots since feed costs represent 60% of the cost of gain. Aside from the initial price of the animal, feed costs is the largest cost in finishing an animal. Two feed additivies, Rumensin[1] and Bovatec[2], have shown in numerous feedlot trials to improve feed efficiency through increased feed savings and result in financial savings to the producer.

Rumensin contains the active ingredient monensin and Bovatec contains lasalocid. Both are ionophores which are a class of antibiotics that work by increasing energetic efficiency and therefore improve feed efficiency in cattle. Under certain conditions they may also stimulate growth. The following are similarities and differences as outlined by Dr. Dan Loy of Iowa State University.

- The improvement in feed efficiency is similar for both products when fed at 33 ppm for Rumensin and 36 ppm for Bovatec. Rumensin generally shows no gain response unless the cattle are on a high silage ration. Then the improvement is approximately 6%.

- The dosage response is different. Feeding Rumensin at the 22-25 ppm level results in about 90% of the response in feed efficiency to the 33 ppm level. At simlar levels with Bovatec (22-25 ppm) the response is much smaller than the recommended 36 ppm level. Thus Bovatec must be fed at the high level whereas Rumensin can be fed at the lower level with about the same effect.

- Adaptability during the starting period differs between products. Rumensin depresses intake more than Bovatec. The manufacturer of Rumensin suggests feeding 11 ppm of Rumensin for the first 28 days followed by the 33 ppm level through to market. A feeding program starting at 22-25 ppm of Rumensin and staying at this level has also been used successfully.

- Bovatec improves feed efficiency approximately 16% over the first 28 days and a little over 4% from day 28 to 112. The reverse occurs with Rumensin, due to a more dramatic decrease in feed intake initially. Rumensin has a 4% response in feed efficiency for the first 28 days and up to a 12% response from 28 to 112 days.

- Recent research suggests there is less benefit of feeding either product on high grain rations as used during feedlot finishing. The higher the roughage component the greater the benefit.

- Bovatec is less toxic to horses than Rumensin and is only mildly toxic to swine.

- Rumensin has reported to decrease the incidence of feedlot bloat and lactic acidosis but it is not cleared for this use.

- Rumensin now has clearance as a coccidiostat due to its effectiveness in reducing the incidence of coccidiosis.

All of the benefits or modes of action of Bovatec and Rumensin are not clearly understood. We know, however, that feed efficiency can be increased at a substantial savings to the feedlot producer. All feedlot producers should consider using one of these products. Which product is up to you.

---

[1] Elanco, Division Eli Lilly Canada Inc. Scarborough, Ontario.

[2] Hoffmann - La Roche Ltd. Etobicoke, Ontario.

# MINERALS & VITAMINS FOR FEEDLOT CATTLE

In many cases, protein supplementation is not required for feedlot cattle. The cattle have met their protein needs thru that supplied in the silage or hay and the cereal grains. However, other nutrients such as calcium, zinc, copper, manganese, selenium, and vitamins AD and E are still needed in the diet. In addition, the feedlot or farm feeder may wish to utilize either Rumensin or Bovatec. These products are needed in such minute amounts that a carrier is required to ensure uniform mixing of the product.

Here are three example rations for a 900 lb steer expected to gain 2.6 lbs per day:

| | LBS. | | |
|---|---|---|---|
| Silage or Hay Equivalent | 15.0 | 15.0 | 15.0 |
| Barley | 16.7 | 16.0 | 16.0 |
| 10% Beef Feedlot Supplement | -- | 1.0 | 1.0* |
| Limestone | 0.2 | -- | -- |
| Fortified Salt | 0.07 | -- | -- |
| Vitamin ADE (10 million potency) | 0.007 | -- | -- |
| Cost/Day | $1.03 | $1.03 | $1.06* |

* Beef feedlot supplement contains either Rumensin or Bovatec.
Ingredient costs taken from Barrhead area, November 18, 1988

These rations supply similar energy, protein, calcium, phosphorous, trace mineral and vitamin levels. Differences between the first two rations will be in ease of mixing to provide a uniform product. Farm mixing facilities are usually limiting such that it is difficult to uniformly mix products which are fed at less than 0.5 lbs per day. The other problem is separation of ingredients. The 10% beef feedlot supplement can be pelleted to reduce ingredient separation.

Note that costs are equivalent between the first two rations. The 10% beef feedlot supplement provides the calcium, trace minerals and vitamins and replaces 0.7 lbs of barley in the diet. As such, feeding a beef feedlot supplement is very comparable in cost and allows for preparation of a more uniform product for the feedlot animal.

The third ration is similar to the second ration except for the addition of Bovatec or Rumensin to the beef feedlot supplement. As shown, feeding Rumensin or Bovatec will cost about 3¢/head/day. Thus a 3% improvement in feed efficiency will cover this cost. Literature suggests that either Bovatec or Rumensin can improve feed efficiency by 8 to 11%.

The bottom line to this discussion is that: Commercially prepared supplements need not add additional cost to feeding an animal especially if the supplement matches the needs of the cattle. Cattle should gain faster on uniformly mixed diets. Faster gains usually translate into reduced costs per unit of gain.

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# BEEF 'N' BACON

Alberta
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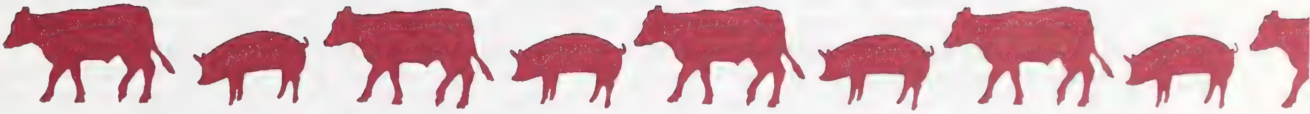

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# RED MEATS

## MEAT IS PERISHABLE

Meats are extremely perishable. The spoilage of raw meats, even in a refrigerator, is rapid. Meat cuts such as steaks and roasts may have a refrigerator shelf life of four days. As the bacteria grow and reach high numbers, the natural red pigment of the meat is changed to a brown color - at this stage the meat is old but not bad. Ground beef or ground pork may only have a shelf life of one day before discoloration occurs. Discoloration is a good indicator of "age" of the meat in the counter but not the safety of the meat.

In the retail meat counter, refrigerated meats are generally packaged with a film that allows oxygen to pass through it. This is because without oxygen, the natural pigment of meat is a dark red color. Consumers are used to a bright red color of beef, in particular, which occurs naturally as the beef is cut and exposed to oxygen in the air.

In the presence of oxygen, spoilage bacteria grow that eventually will cause the meat to smell and taste unpleasant. However, this only occurs when spoilage bacteria have reached numbers of 10 to 100 million per gram or per square centimeter of the surface of the meat.

The storage temperature of meats affects the rate at which bacteria grow. As the temperature is reduced, the rate of growth decreases so that the same bacteria that doubled every 15 minutes at 20 - 37°C only double every 6 to 8 hours at refrigerator temperature.

When meat is frozen in the home and then thawed on the countertop (room temperature) during the day, the growth rate of bacteria will increase as the temperature of the meat increases. Thawing meat in the refrigerator will ensure that the rate at which the bacteria grow is minimized.

# REDUCING HOG PRODUCTION COSTS

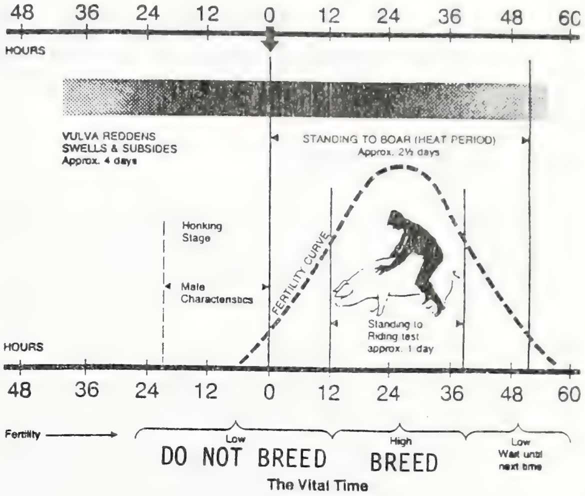
## THE BREEDING HERD

The purpose of the breeding herd is to produce the maximum number of piglets for the least cost. You can wean 20 or more pigs per sow by understanding the reproductive process of the pig and taking care of some of the basics.

## BREEDING

If sows aren't properly bred you will never achieve 20+ pigs/sow/year. The chart on the right shows a fertility curve for an average sow. The sow releases her eggs about 36 hours after the start of standing heat. To get maximum litter size here are some pointers:

- breed every sow twice with a different boar each time.
- heat detect twice daily after weaning, most healthy well fed sows will show heat 5-6 days after weaning.
- if a sow is in heat in the morning breed in the afternoon and the next morning.
- if a sow is in heat in the afternoon breed the next morning and afternoon.
- provide one boar for every 18-20 sows in the herd.



## FEEDING

The breeding herd should be fed a balanced ration at the right levels to achieve maximum performance and long life. There should be one ration for dry sows and boars, with a separate nursing sow ration. The nursing sows requirements for protein and energy are much higher than the dry sow. How you feed the breeding herd has a big impact on performance. Here are some pointers:

- a sow housed totally inside will eat about one tonne of feed a year, the outside herd will eat 10-30 percent more.
- do not get your sows fat in the dry period, feed enough to keep them in good shape.
- the more a sow eats in the dry period the less she will eat in the crate.
- 4.5 - 5.5 pounds per day for inside sows will keep sows in shape on most operations.
- skip a day feeding for outside sows will often prevent overfat sows.
- full feed sows nursing a litter, the problem is trying to get enough feed into them.
- a nursing sow should eat at least 12 pounds per day.
- full feed sows from weaning until breeding and cut back to the dry sow level after breeding.
- always ensure adequate water, nipples in farrowing crates should deliver at least half a gallon every minute.

## CONCLUSION

Other considerations are breed of hog, environment, management and others. Taking care of the little things often results in the big things taking care of themselves. You can't control the price of your product, but you can do a lot to reduce costs of production. In the breeding herd this means maximum pigs per sow per year.

# TREATING SPLAYLEG

Splayleg is probably the most important inherited disorder of piglets. Although in many operations splayleg occurs more often than producers realize, up to 1.5 to 2.0% of piglets born all over the world suffer from it. This condition also known as spraddle legs is seen in newborn piglets whose muscles are too weak. In mildly affected piglets, hind legs slip sideways and the piglets end up sitting with their hind legs spread out. Severely affected pigs may show the condition in their fore legs as well.

The stiffness in muscles and imbalance caused by this condition prevents piglets from getting an adequate and regular suckle. Often, piglets that are still able to move around the pen are eventually crushed by the sow. On average, about one half of the piglets with splayleg survive.

## IDENTIFYING THE CAUSES

Splayleg is not a simple problem and appears to arise from a combination of factors. Outbreaks of the problem are often seen, followed by a return to normal conditions, both equally difficult to explain. Although the exact cause is not precisely known research has shown that:

- Low birthweight pigs are more frequently affected.
- The incidence of splayleg is higher in male piglets.
- Certain boars produce more splayleg piglets. In addition, of 4,411 male and 4,248 female progeny born between 1979-83 at the University of Missouri, the Landrace boars consistently produced more splayleg piglets.
- Slippery pen floor and slats promote the occurrence of splayleg.
- Mycotoxins in pregnant sow feed may increase the incidence of splayleg.

## SAVING SPLAYLEG PIGLETS

The following suggestions have been found to be useful in saving splayleg piglets:

1. Tender Loving Care
   Recovery rate improves considerably when affected piglets are dried off immediately after birth and ensured that they receive their share of colostrum and milk. Supplemental feed using a syringe if necessary.

2. Proper Footing
   Death losses increase where piglets are unable to reach the sow's udder. A jute sack, rubber mat, or shavings on the floor helps.

3. Taping
   Binding the pigs hind legs together just above the pastern joints (about 2 to 2.5 inches apart) using elastic tape allows the pig to stand and move about. Do not use string. Remove after three to four days

4. Massaging
   Using both hands hold the pig by the rear legs. With your thumbs vigorously massage the lower back and leg muscles for two minutes. Flex each leg easily once muscles have relaxed. Encourage the piglet to stand. Repeat three to four times in the first day.

# SWINE LOADING AND WEIGHING FACILITY

① Loading chute. If steps are used, treads should be 10" wide and 3½ " high (maximum). Maximum 20° slope.

② If this is a temporary wall, on a portable chute it may be removed for loading cattle.

③ 4 ft. weigh scale access gate.

④ 2 ft. x 4 ft. weigh scale.

⑤ Man access for scale operation (1 ft)

⑥ Step over fence (30 inches high)

⑦ 3/8 inch plywood (4 ft high) on curved section.

⑧ 6 ft. crowd gate.

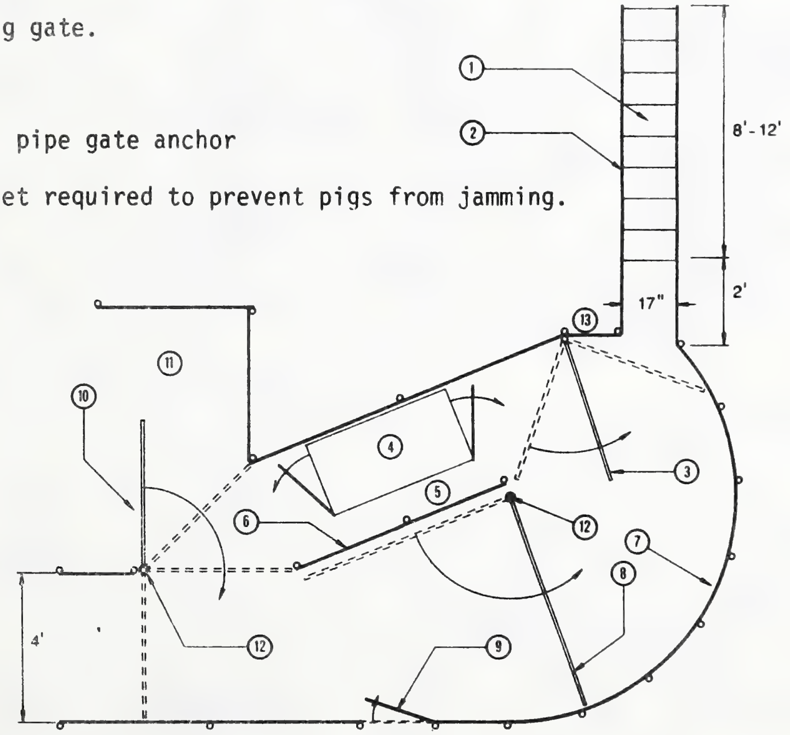
⑨ 2 ft. man gate.

⑩ 4 ft. sorting gate.

⑪ Holding pen.

⑫ 2 inch steel pipe gate anchor

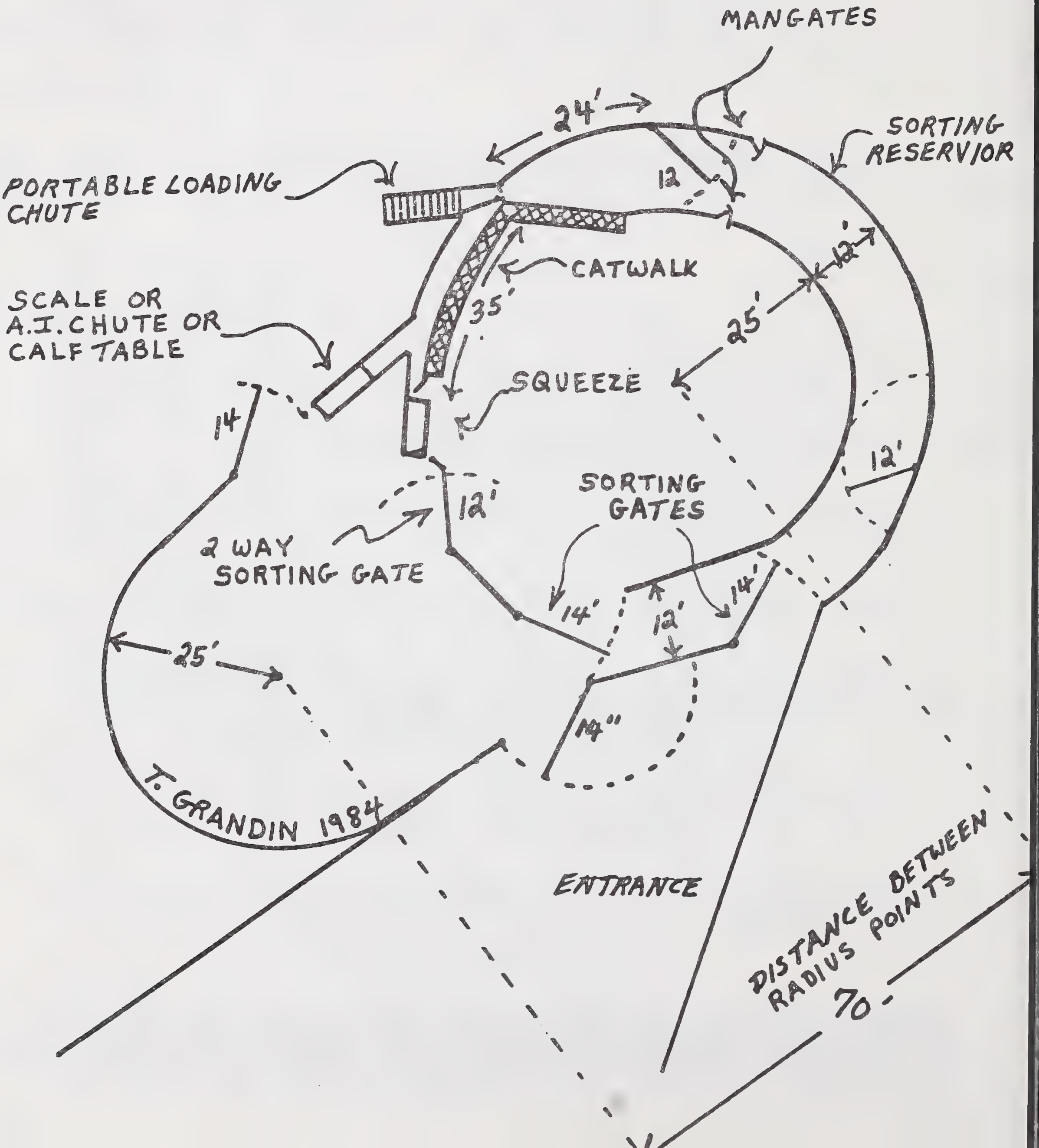
⑬ 18 inch offset required to prevent pigs from jamming.



This facility allows pigs to be moved from the barn, around the curved chute, weighed at the scale and then sorted back to the barn or to the holding pen. When the truck arrives, the pigs are moved from the holding area, around the curved chute, then up the loading chute.

# SMALL CIRCULAR HANDLING CORRAL

Here is a plan for a simple but effective circular cattle handling facility. It could easily handle a 50 cow-calf herd and has a two-way sort back off the sorting reservoir as well as a two-way sort off the squeeze.


MANGATES
24'
12
SORTING RESERVIOR
PORTABLE LOADING CHUTE
CATWALK
12'
35'
25'
SCALE OR A.I. CHUTE OR CALF TABLE
SQUEEZE
14
12'
SORTING GATES
12'
2 WAY SORTING GATE
14'
12'
14'
25'
14"
T. GRANDIN 1984
ENTRANCE
DISTANCE BETWEEN RADIUS POINTS
70

# WATER QUALITY FOR BEEF CATTLE

| ITEM ANALYZED | WATER CONTENT (ppm) | USEFULNESS FOR CATTLE & HORSES |
|---|---|---|
| Alkalinity | <500<br>pH<8 | No problem |
| | 500-1000<br>pH 8-8.5 | Satisfactory |
| | 1000-2500<br>pH 9-10 | May be unsuitable for young calves or lactating cows |
| | 2500<br>pH>10 | at higher levels |
| pH | <8.5 | No problem |
| | 8.5-10 | Tolerable |
| | >10 | Unsuitable |
| Sodium | <300 | No problem |
| | >300 | Satisfactory depending on pH & alkalinity |
| Potassium | <300 | No problem |
| | >300 | Satisfactory depending on pH & alkalinity |
| Nitrites | Trace | Satisfactory |
| | 10 ppm | Health hazard |
| Nitrates | <100 | No problem |
| | 100-300 | Health hazard |
| | >300 | when fed with feeds high in nitrates |
| Iron | <10 | No problem |
| | >10 | Palatability problems |
| Fluoride | <4 | No problem |
| | >4 | Weakening of teeth |
| | >40 | Osteomalacia |
| Conductivity | | Related to total dissolved solids |
| Total dissolved solids | <1500 | Very Good |
| | 1500-3000 | Good |
| | 3000-4000 | Fair |
| | 4000-5000 | Usable |
| | >5000 | Can lead to problems |
| | | Unsatisfactory |
| | | Toxic |
| Hardness Ca & Mg | <100 | No problem |
| | 100-2000 | No problem |
| Sulphate Measured as S04 | <500 | No problem |
| | 800-1000 | Increasing possibility of problems. |
| | >1200 | Can lead to problems. |
| Chloride | <500 | No problem |
| | 500-5000 | No problem |
| | | May reduce voluntary salt intake. |

Water is considered the most important essential nutrient. Animals may live more than 10 times longer without food than without water. The body can lose almost all of its fat and over half of its protein and yet live. But a loss of one-tenth of its water can result in death.

The water content of newborn animals is approximately 75-80%. In adults water content varies depending on the body fat, but on a fat free basis, it is approximately 75%.

The functions of water are diverse and range from body metabolism, transport medium, temperature regulation, lubrication, and a cushion for the nervous system.

Water requirements are variable and are affected by such factors as environmental temperature, humidity, type of production, species of animal and amount and type of feed consumed. It is difficult then to give specific requirements as is done for other nutrients.

Livestock water contains dissolved and suspended materials that affect water quality. Listed in the table are specific items, a breakdown of quality levels and its usefullness for cattle and horses. Rather than assuming your water is satisfactory, have it tested and consult with a professional.

( < indicates less than)
( > indicates more than)

# CALVING PROBLEMS

Calving problems represent the number one reason for baby calf death losses. In Alberta, at least 28% of the calves that die, will die as a result of calving difficulties Here are some factors associated with calving difficulty:

1. Calves from difficult births have a 4 times higher death loss 24 hours postpartum than calves from normal births.
2. Calves from difficult births weigh 7 pounds more at birth than calves from normal births.
3. Calves from difficult births gain 5% more from birth to weaning than calves from normal births.
4. Heifers having difficult births or requiring cesarean sections have extremely low fertility and are frequently culled.
5. Second calvers and mature cows having difficult births will be delayed 14 days in rebreeding and have a 15% reduction in conception rate than those having normal births.
6. Calves from difficult births have a 50% increase in sickness (scours or pneumonia) and a 10% increase in death loss from 1 day of birth to weaning.

Our present emphasis to find growthier cattle suggests that calving difficulty will continue. In fact, it can be argued that we must accept a certain level of calving difficulty in our beef herds if we expect to maximize profits. This aside, here are some ways to minimize calving difficulty.

1. Heifer selection.

   Select as replacements, heifers which were born unassisted and who were born early in the calving season. This will help ensure that replacements have come from the most fertile cows in your herd. A pelvic measurement may become a selection criteria for heifers and bulls in the future.

2. Bull Selection.

   Select moderately sized birth weight bulls that have been born unassisted. Take into consideration the bone structure, size of head and roughness of shoulde when choosing a bull. It is not adequate to simply choose a British breed bull a expect calving ease for heifers. If your herd average birth weight is 90 lbs, th the bull you select for your heifers should have had a birth weight not greater than your average and preferably up to 5 lbs lighter. A bull for your mature cow that replacements are selected from, should ideally be close to your herd's avera birth weight. A bull that is bred to cows where no replacements are selected car have had a birth weight 10 to 20 lbs greater than your herd average.

3. Cow Condition.

   Cows that are either too fat (condition score 4 or 5) or are too thin (condition score 1) will have an increased incidence of calving difficulty. The ideal condition score at calving is a 2 1/2. That is, the short ribs, are rounde and require firm pressure to be felt. Nutrition can be an underlying cause of many livestock problems. A well balanced diet not only reduces the incidence of calving difficulty but also reduces the effects of calving difficulty should it occur and results in a stronger livelier calf.

4. Exercise.

   It is presumed that having pregnant cows walk up to a 1/2 mile for water wi result in fewer calving problems.

# BEEF'N' BACON

Alberta
AGRICULTURE

FEB 15 1989

FEBRUARY 1989 VOL. 4, NO. 5

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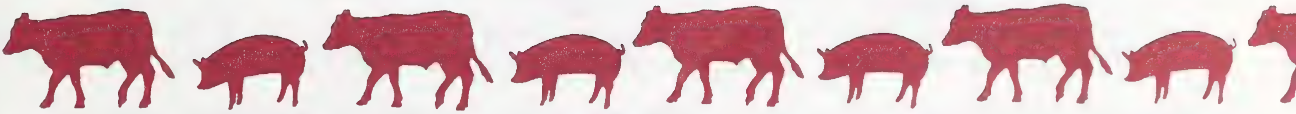

## INTRODUCTION

Beef 'n' Bacon was initiated in the fall of 1985 as a winter livestock program for the North West Region of Alberta. In 1987 it was expanded to include the North Central Region. The newsletter's objective is to reach livestock producers with timely and pertinent topics. It is not our intention to explain the subject matter in elaborate detail. Instead, we hope to spark your interest.

Issues of Beef 'n' Bacon are distributed to approximately 4300 livestock producers and agri-businesses in Alberta. It is written and edited from the Barrhead and Red Deer Regional Offices. District Comments (optional) are added by the District Agriculturist.

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# RED MEATS

## BALANCING THE FAT FACTS

Many Canadians are unsure or misinformed about how to lower their dietary fat intake. In fact, some people have overreacted, thinking that if a little moderation is good, drastic dietary changes are even better. Some adults make the mistake of cutting out whole food groups. Meat is often avoided in the belief that it is impossible to include it in a low-fat diet. Actually the fat in meat is not all bad -- it provides energy, aids in absorption of fat soluble vitamins and provides essential fatty acids. In addition meat provides protein, iron, zinc and B vitamins to the diet.

Here are some practical tips for reducing your fat intake:

| CHOOSE | INSTEAD OF | GRAMS OF FAT SAVED | CAL. SAVED |
|---|---|---|---|
| 90 g trimmed sirloin steak | 90 g untrimmed sirloin steak | 4 | 36 |
| 250 mL skim milk | 250 mL whole milk | 9 | 81 |
| 90 g trimmed pork loin steak-centre cut | 90 g untrimmed pork loin steak-centre cut | 7 | 63 |
| 1 regular hamburger (fast food) | 1 regular fish sandwich (fast food) | 12 | 108 |
| 125 mL tuna, canned in water | 125 mL tuna, canned in oil | 6 | 54 |
| 1/2 chicken breast, without skin | 1/2 chicken breast, battered and fried | 15 | 135 |
| 15 mL reduced calorie dressing | 15 mL regular salad dressing | 4 | 36 |
| 2 slices bread/toast | 1 croissant | 11 | 99 |
| 1 baked potato | 10 french fries | 8 | 72 |
| 1.30 g slice ham, beef, pork | 30 mL peanut butter | 12 | 108 |

# ROUTINES MAKE CENTS

Maintaining a regular routine in your swine operation is extremely important in order to maintain pigflow, cashflow and generally get the most out of your operation.

Instead of thinking in terms of so many sows, think in terms of your facilities and how they can be used as efficiently as possible. For example, if you had 25 farrowing crates, you could farrow five sows every week and keep your crates in constant use. I'm assuming four week weaning and one week for cleaning and grace. With 52 weeks in a year and 5 farrowings every week, you can aim for 260 litters (52 x 5) every year. If you get 2.2 litters per year out of every sow, then you should be running 118 sows (260/2.2). If you can manage only 2 litters, then you need 130 sows to keep your crates full. Farrowing crates are only one part of the operation and the other areas also have to handle the pigs without overcrowding.

If you work toward so many farrowings a week, in our case 5, then you can get into a simple weekly routine to keep things flowing.

Here's an example of some typical weekly routines:

- Thursday - Wean 5 sows, wash farrowing area. Let area dry before reusing.
- Friday - Move the next sows due into the new crates, this could also be done next week but give them a few days to adjust and remember some sows farrow early.
- Weekend - Check the newly weaned sows for signs of heat.
- Monday to Wednesday - Breed the 5 sows weaned last week plus 1 extra (a gilt from the gilt pool or a sow that repeated).
  Every sow that breeds does not always farrow, so you need to know the farrowing rate for your herd. Farrowing rate is the number of sows that farrow, divided by the number that get bred. In our case, we will assume 85% farrowing rate.
  - 6 bred times 85% will give you 5 that farrow.
- Thursday to Saturday - The sows put into the crates last Friday will start to farrow. If sows are bred on a Monday or Tuesday, they will farrow around 16.5 weeks later which puts them at a Thursday or Friday for farrowing.
  - cut teeth, dock tails and give iron to the new piglets.

## A REGULAR ROUTINE WILL:

- Make better use of your facilities.
- make better use of your time.
- make more efficient use of your boar power.
- give you a better handle on the productivity of your operation.

## Conclusion

Taking care of the "little" things in a swine operation results in more production with the same inputs, this means more profits for you.

A regular routine is one aspect of good management that will translate into increased profits.

# ASSISTING SOWS AT FARROWING

Most sows require no assistance during farrowing. The majority of pigs are born in normal birth presentations and without any problem. Approximately 55% of pigs are born in the anterior (forward) presentation. The head comes first with the front legs stretched along the chest. The remaining 45% of pigs are born in the posterior (backward) presentation. These pigs are born with their back legs first and the front legs extended under the chin.

## WHEN TO ASSIST

The process of delivery averages 2.5 hours (range of 1.5 to 10.5 hours) with an interval between piglets of about 16 minutes (range of 7 to 52 minutes). Each farrowing requires individual assessment as to when intervention is required. As a rule, sows should be examined if:

- The sow has exhibited strong signs of labour for at least 30 minutes and no piglets have been born.
- Piglets have been born, the sow continues to strain and bicycle, and there has been a delay of 30 minutes. The interval preceding a stillborn piglet averages 35.5 minutes.

## USING THE RIGHT APPROACH

1. Be Gentle
   - Do not over examine, over manipulate or make extraordinary efforts to deliver pigs. If you have big hands, teach the procedure to someone with a small hand and forearm.
   - Prevent damage to the reproductive tract by making sure fingernails are clipped shor
2. Maintain Extreme Cleanliness
   - Wash you hand, your forearm and the sow's vulval area thoroughly using a germicidal soap. Rinse well as some products can iritate the vagina.
   - Wear disposable plastic sleeves whenever possible. Protect yourself form diseases such as leptospirosis, brucellosis and streptococcis suis that can infect humans.
   - Wash and disinfect all farrowing tools.
3. Lubricate Well
   - Obtain a good over-the-counter lubricant from your veterinarian.
   - Sows that have been farrowing for a while tend to be extremely dry inside. Lubricat your hand, forearm or plastic sleeve thoroughly. Place an ounce of lubricant deep into the vagina. A plastic squeeze bottle works well.
4. Follow The Right Technique
   - Make sure the sow is lying comfortably with no obstructions at the rear of the crate Use your left hand if the sow is lying on her left side, your right hand if she is lying on her right side.
   - Using two fingers check inside the vulva for pigs near the end of the birth canal.
   - Finding none, shape your hand like a cone and gently proceed into the vagina. Do not reach further than you have to.
   - Most pigs can be grasped using the forefingers and thumb. Pull gently.

## DEALING WITH ABNORMAL BIRTHS

Oversize pigs and abnormal presentations are rarely a problem. Most problems are piglets wedged by the shoulders in the sows bony pelvic area. Lubricating the piglets' shoulders resumes normal farrowing. Problems in farrowing sows that can often be corrected by your assistance are:

- Breech presentations
- Piglet head flexed back
- Oversized piglet
- Two pigs together presented at once
- Pigs in doubled-over position
- Small sow pelvis

# HOW TO DESIGN A RECIRCULATION VENTILATION SYSTEM

① Calculate the Recirculation Rate

$Q_r$

cubic feet per minute (cfm)

= floor area in square feet ( $ft^2$ )

X 0.75 (cfm per $ft^2$ )

Choose the recirculation fan

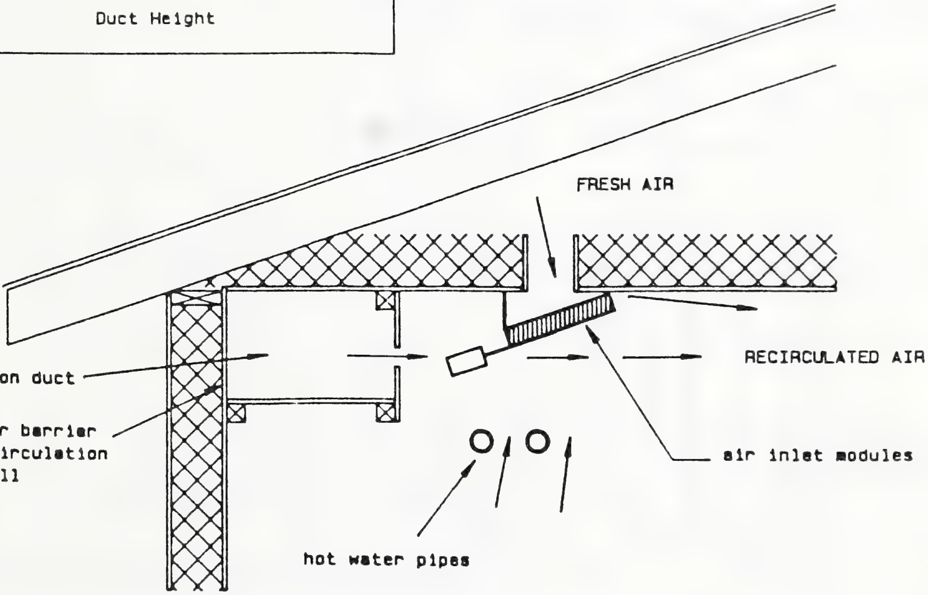
based on 1/4" static pressure

② Calculate the duct size

cfm of air flow based on 1000 cfm per square foot

| Duct Width | 8" | 9.5" | 12" | 16" | 24" |
|---|---|---|---|---|---|
| 8" | 400 | | | | |
| 9.5" | 500 | 600 | | | |
| 12" | 650 | 750 | 1000 | | |
| 16" | 850 | 1000 | 1300 | 1750 | |
| 24" | 1300 | 1550 | 2000 | 2650 | 4000 |

Duct Height


FRESH AIR
RECIRCULATED AIR
recirculation duct
extra vapour barrier between recirculation duct and wall
air inlet modules
hot water pipes

③ Determine the hole size $A_o$

| Duct to wall distance | hole size | hole area ( $ft^2$ ) |
|---|---|---|
| 6' | 3/4" | .0031 |
| 8' | 1" | .0055 |
| 10' | 1 1/4" | .0085 |
| 12' | 1 1/2" | .0123 |
| 14' | 1 3/4" | .0167 |
| 16' | 2" | .0218 |

④ Calculate the number of holes

Number of holes based on a jet velocity of 1200 ft/min and an effective jet cross-section area of .75 times the actual hole area

$$N = \frac{Q_r}{900\ A_o}$$

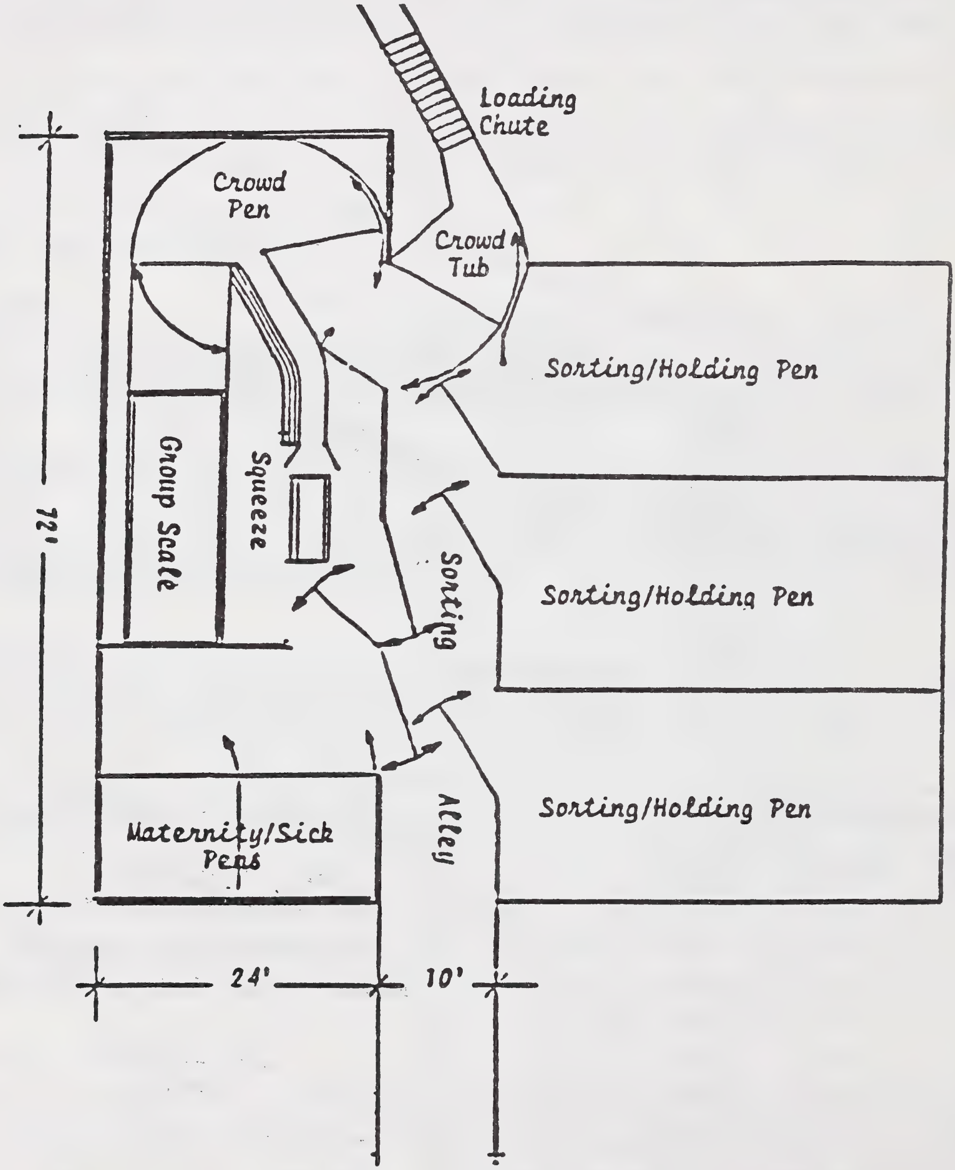
⑤ Calculate the hole spacing

Ducts with one row of holes - spacing= duct length / number of holes

Ducts with two rows of holes - spacing = ( duct length X 2 ) / number of holes

## SMALL HANDLING CORRAL

This plan shows a unique handling system that fits nicely into a 24' x 72' pole shed. The sorting alley from the feed pens and the sorting pens are outside. There is a separate crowd tub for loading, and a crowd pen that feeds into either the curved working chute or into a group scale (or individual scale). There are numerous options for sorting off of the squeeze.


Loading Chute
Crowd Pen
Crowd Tub
Sorting/Holding Pen
Group Scale
Squeeze
Sorting
Sorting/Holding Pen
72'
Maternity/Sick Pens
Alley
Sorting/Holding Pen
24'
10'

# FOOT ROT OF BEEF CATTLE

Foot rot is usually described as being caused by foot injury or foot injury followed by infection. There are many bacteria associated with foot rot but the causative agents are not well understood and more is being learned all the time.

The disease appears to be contagious and the incidence is much higher during wet humid weather or when conditions are wet underfoot. Stony ground, lanes filled with sharp gravel and pasturing on coarse stubble can predispose cattle to the condition.

To become infected and exhibit signs of inflammation the continuity. of the foot or adjacent skin must be broken. This provids a port of entry for the infectious agent that is ever present in the feedlot or pens. When skin between the toes, along the coronary band, or soft part of the hoof is injured, infection follows. Exposure to manure, mud or water, frozen rough ground or extreme drought might also contribute to the infection.

The first signs of foot rot are varying degrees of lameness from barely noticeable in one foot to a more extensive condition including fever. Temporary depression of milk yield in cows may result and affected bulls may be temporarily infertile. Feedlot cattle will have reduced feed intake and gain.

Many of the problems can be avoided by thoroughly cleaning pens after cattle are removed. Maximum drainage is essential and the cleaning of yards of old machinery, bottles or any sharp objects will aid in preventing injury and infection. The building of mounds in feedlots can help to prevent foot rot.

## Control

Prevention of foot injuries by filling in muddy and stony patches in barn yards and lanes will reduce the incidence of the disease. Provision of a footbath containing a 5 - 10% solution of formaldehyde copper sulfate, in a doorway so that cattle have to walk through it twice daily, will practically eliminate the disease on dairy farms. This is not practical in most cases on beef operations. Spreading of lime with 5 - 10% copper sulfate around waterers and feed bunks may be helpful in feedlots or feeding chlortetracycline to feedlot cattle (500 mg/hd/day for 28 days followed by 75 mg/hd/day through the fattening period) also reduces the incidence of foot rot. The feeding of organic iodide has been used for many years as a preventative against the disease but recent work suggests this does not reduce the frequency of experimentally induced foot rot in cattle. Recent research also indicates that zinc may play a role in the prevention of foot rot.

## Treatment

Treatment is normally through the use of antibiotics or sulfonamides and local treatment of the foot lesion. Immediate treatment as soon as possible after the onset of swelling and lameness will usually give excellent recovery in 2-4 days. In some cases where the infection has spread to deeper tissues, surgical drainage may be necessary.

Foot rot can be a persistent problem on some farms and feedlots. There often is no one answer to the dilemma and control becomes difficult. It is advisable that a veterinarian be consulted before any control or preventive program is instituted so that a trained professional can work with you to reach a solution.

# MID-PREGNANCY FEEDING AND REBREEDING

A 5 year study of reproductive performances of 45 to 78 Hereford range cows has some interesting implications as to how we should winter cattle and perhaps when we should start feeding cows or even wean calves in the fall. The researchers (G.E. Selk and his associates) divided the cow herd into 4 feeding groups. These groups were:

M - Fed to maintain bodyweight from November until calving in March and April
LM - Fed to lose 5% of body weight by 8 weeks before calving and then maintain weight until calving.
LL - Fed to lose 5% of body weight by 8 weeks before calving and then lose an additional 5% by calving.
LG - Fed to lose 5% of body weight by 8 weeks before calving and then gain back the lost 5%.

All cows here fed 4 lbs of supplement and unlimited grass hay after calving

Average Reproductive Performance over a 5 year period

| | TREATMENT | | | |
|---|---|---|---|---|
| | M | LL | LM | LG |
| Body Condition Score** | | | | |
| November 15 | 3.0 | 3.0 | 3.0 | 3.1 |
| January 20 | 2.9 | 2.6 | 2.6 | 2.6 |
| *May 1 | 2.7 | 2.5 | 2.5 | 2.7 |
| Pregnancy Rate (%) | 71.3 | 41.8 | 51.3 | 58.3 |
| Calving to Conception (Days) | 95.5 | 97.3 | 98.5 | 98.1 |
| Calving to First Heat (Days) | 66.5 | 72.9 | 66.9 | 67.1 |

* 90 day breeding season starting May 1.

**Body Condition Score - 1 = emaciated, 5 = excessively fat

These results suggest that:

1. Body weight change from fall to the start of breeding influences the time to the first heat cycle after calving.

2. Cows fed to maintain body weight during pregnancy had a greater pregnancy rate during the following breeding period then cows that lost or lost and regained body weight.

3. If body weight or condition loss occurs in the middle third of pregnancy, increased feed intake 1 to 3 months before calving will substantially improve pregnancy rates for the following breeding period.

4. Cows with similar body condition at calving may differ in rebreeding performance due to body weight or body condition changes during mid gestation.

For cow herds which start calving in mid-February, the equivalent weight loss period of this study will fall between mid-October and mid-December. This coincides with that period around weaning time or immediately after and a period when cows are either cleaning up mature pasture or stubble fields or are being started on the winter feeding program. This research indicates that a body weight loss of as little as 5% during this period can affect subsequent pregnancy rates. Planning ahead and having good fall pasture or perhaps weaning earlier warrants consideration based on the outcome of this research.

(Source - Selk et. al., J. Anim. Sci., 1988)

AL.1.811

# BEEF 'N' BACON

Alberta AGRICULTURE

CANADIANA
APR - 4 1989

MARCH 1989 VOL. 4, NO. 6

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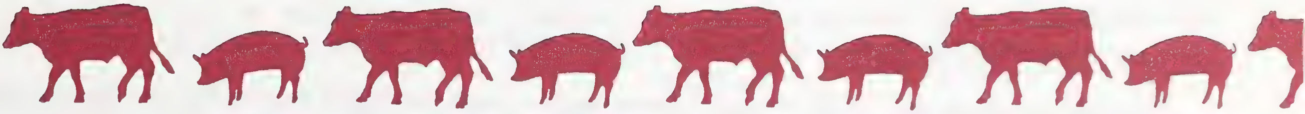

## INTRODUCTION

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# RED MEATS

## GROWTH IMPLANTS -- CONSUMER SAFETY

Growth implants used in beef production supply additional anabolic sex hormones or cause the animal to increase its own production of these hormones. People are naturally concerned about any possible effects on sexual function or risk of cancer.

### Implanted Beef

500 grams (1.1 lbs) of beef from an unimplanted steer contains an average of 6.1 nanograms of estradiol equivalents. The same beef from an implanted steer would contain from 7.0 to 11.4 ng of estradiol, an increase by a factor of 1.9 (Table 1).

### Other Foods

Table 1 shows that other foods we consume contain 7.5 to 2,000 times as much estrogen as we would consume from a pound of beef from an implanted steer.

**Table 1:** ESTROGEN INTAKES, VARIOUS FOODS

| Food | Portion (grams) | Estrogen Intake (nanograms) | Compared to Implanted Beef |
|---|---|---|---|
| Steer beef | 500 | 6.1 – 11.4 | 1.0 times |
| Cow beef | 500 | 75 | 7.5 |
| Milk | 500 ml | 75 | 7.5 |
| Peas | 100 | 400 | 40 |
| Eggs | 50 – 60 | 1,750 | 175 |
| Cabbage | 100 | 2,400 | 240 |
| Soybean oil | 10 ml | 20,000 | 2,000 |

A nanogram is 1 billionth of a gram.

### Estrogen Production in Humans

Consuming 500 grams of beef would increase our body estrogen levels by one thousandth of one percent in males and by as little as three millionths of one percent in pregnant women.

(Source: R. Gould, Alberta Agriculture)

# WHICH BREEDING STOCK?? START OUT RIGHT

Many producers build good facilities designed for high production and then buy diseased, genetically poor breeding stock to fill these facilities. The pigs genetics and health are going to determine their performance and the profit you make on your farm. Investment in breeding stock is small relative to investment in equipment and facilities, yet it is hogs performance that will determine your profit. So how do you know you are getting good breeding stock?

## IDENTIFYING SUPERIOR STOCK

The Alberta Swine Improvement Program and the Swine Herd Health Program are two programs that can help you identify good breeding stock.

1. The Alberta Swine Improvement Program: With this program, potential gilts and boars are weighed and backfat tested by a government technician who makes regular visits to the farm. All backfat and days are adjusted to 90 kg so that animals can be compared on an equal basis.

   A new system called EBV'S (estimated breeding values) was recently added to the program. EBV'S takes relatives into consideration so that between herd comparisons can be done.

   The Swine Improvement Program produces a report twice a month which lists all the latest animals tested. This report is a good tool to help identify good boars for use in your herd.

2. The Alberta Swine Herd Health Program: This program helps identify the health status of a herd. A breeder on this program has to submit hogs on a regular basis. A veterinarian inspects these hogs and scores them according to the condition of the heads and lungs. A regular report is also available on the status of heads and lungs of herds on this program.

   A new category called High Health will identify herds free of eight diseases.

   Find out about the health status of a herd before buying stock. Make the breeder prove that his herd is free of certain diseases. Many people spend ten's of thousands of dollars to depopulate and start with clean stock. Doesn't it make sense to start with healthy stock!!

## OTHER CONSIDERATIONS

Pay a lot of attention to good feet and legs in stock you are buying. Don't except stock with poor feet and legs.

Make sure gilts and boars have at least 14 well formed and well spaced teats.

## CONCLUSION

Be fussy when buying breeding stock. Pay a lot of attention to performance testing because this is the sure way to get stock that grows faster and is leaner every year. Make sure stock you buy is free of diseases you do not have.

Remember that no matter how good a manager you are, the quality of your breeding stock will be your limiting factor if everything else is geared to high performance.

# WHICH FLOORING FOR PIGS

Many new types of flooring materials have evolved in efforts to reduce labor inputs and improve manure handling capabilities. Many developments by industry and at the farm level have been made with little concern for pig comfort or the subsequent effects of flooring on pig performance or feet and leg problems. Floors must meet a wide range of needs. In short, floors should be comfortable to the pig, easy to clean, durable and economical.

## FROM CONCRETE TO PLASTIC

In the past straw bedding was used for nearly every pig. Although solid floors and conventional concrete slats are still used in many areas of the swine unit, totally perforated floors have become more practical. Research on flooring for pigs has shown that:

- Straw serves some recreational use. Piglets raised in the absence of straw are more restless and nibble more at their littermates and the sow. This is a learned behavior that can affect behavior patterns in later life.
- From a pig's point of view the need for straw can be eliminated if the temperature is sufficiently high. In relation to solid concrete, four inches of straw is worth +4°C to the pig. Concrete slats are worth - 5°C and wet solid concrete -10°C.
- Pigs tested on six concrete surfaces (fine and coarse sand, fine and coarse broom, wood broom, wood float, and steel trowel) showed greater slipping on a steel trowelled floor.
- Under recommended environmental conditions pig performance is not affected by differences in perforated or slatted floor types.
- Pigs select floors based on void:solid ratio, surface temperature, traction and friction.

## TAKING ADVANTAGE OF PIG PREFERENCES

Pigs select floors on the basis of reclining comfort. The comfort of a floor is affected by its bearing surface, structure, and temperature. Tests show that pigs are able to make quick decisions on floor type. Pigs, especially young ones, have a high preference for plastic floors. As shown in the following table simultaneous preference tests carried out at the University of Saskatchewan in 1983 showed pigs overwhelmingly preferred to lie on plastic coated expanded metal.

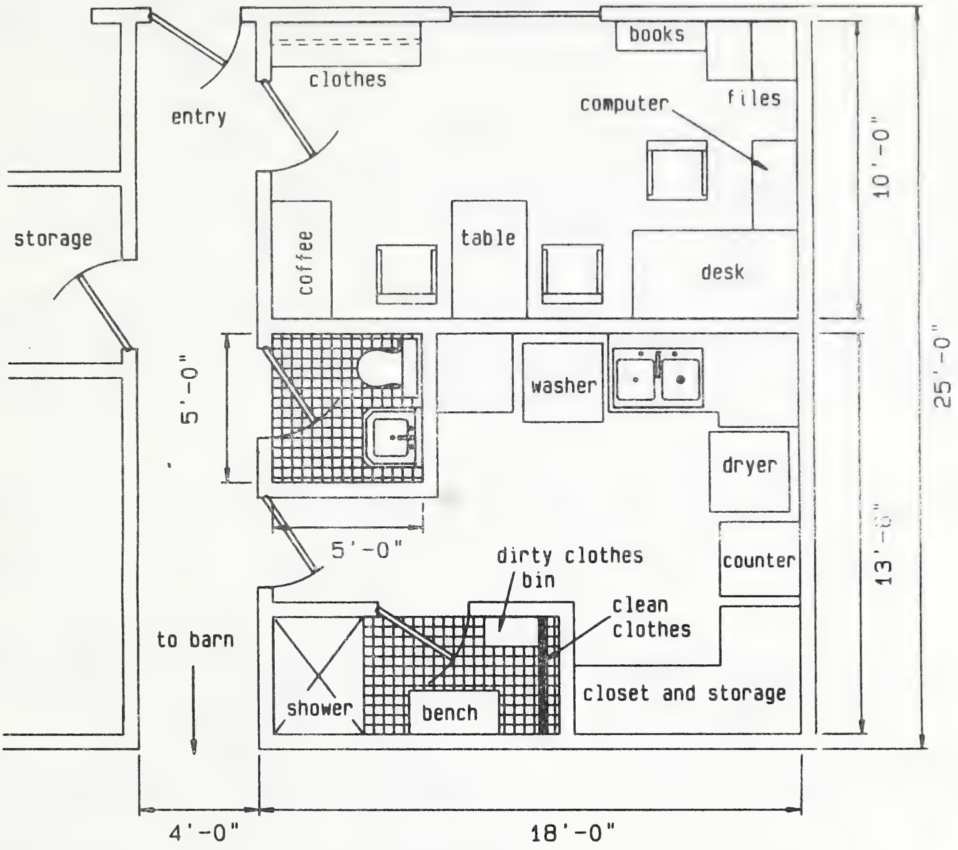
| Time Spent (%) | Lying | Standing | Total |
|---|---|---|---|
| Plastic coated expanded metal | 25.6 | 21.0 | 46.6 |
| Fibreglass slats | 1.7 | 13.8 | 15.5 |
| Molded plastic | 3.0 | 13.4 | 16.4 |
| Expanded metal | 3.0 | 18.5 | 21.5 |

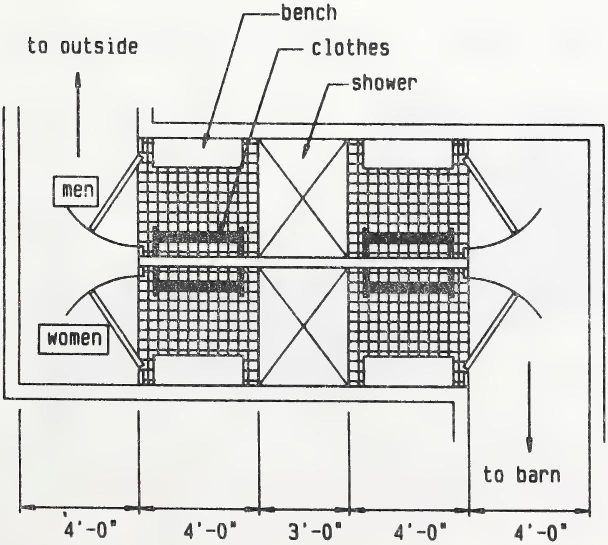
Results of preference tests should enable manufacturers to identify floor surfaces that better meet the needs of pigs. Given this information it is possible to control the location where pigs lie in a pen by using more than one floor type.

## OBSERVE PIGS

Research has shown pigs settle in a preferred lying area within 30 to 60 minutes of being placed in a pen. Pigs choose a lying area first, followed by a dunging area as far away as possible from the lying area. Observing pig behavior can indicate the adequacy of the flooring materials. Dunging patterns and group postural behavior (huddling and piling on one another) are good indicators of pig comfort.

# PIG BARN OFFICE


books
files
clothes
computer
entry
10'-0"
storage
coffee
table
desk
washer
25'-0"
5'-0"
dryer
5'-0"
dirty clothes bin
counter
13'-6"
clean clothes
to barn
shower
bench
closet and storage
4'-0"
18'-0"

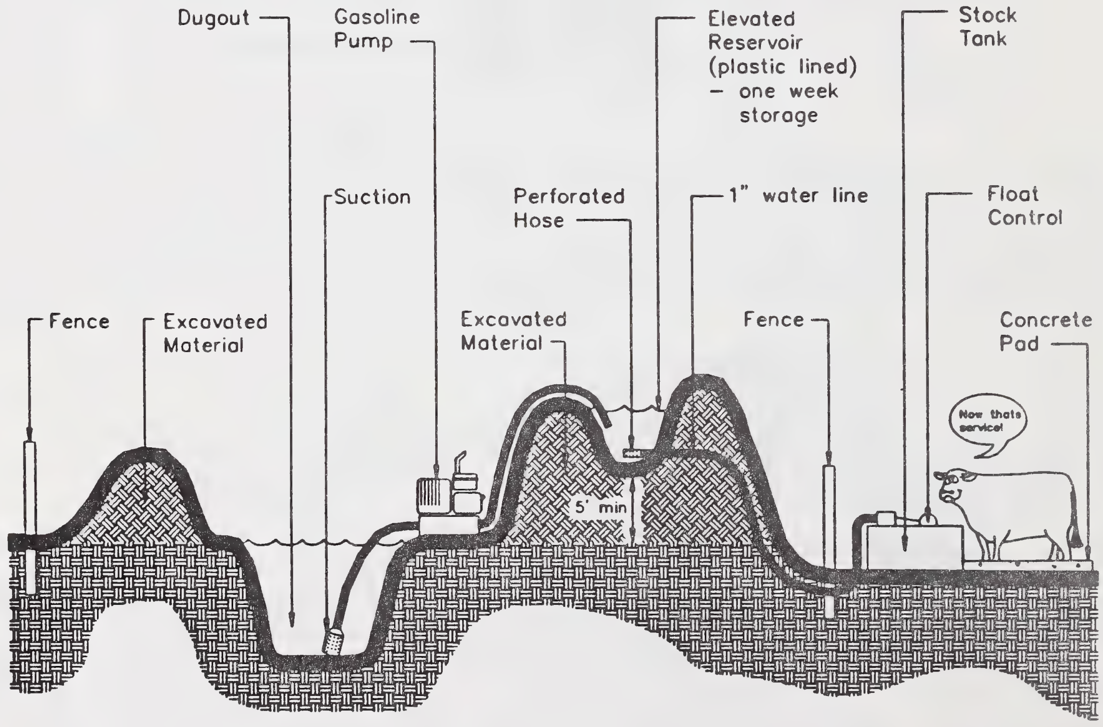

bench
to outside
clothes
shower
men
women
to barn
4'-0"
4'-0"
3'-0"
4'-0"
4'-0"

Larger farms with several employees could use an office and utility room with a meeting area, washroom, shower, and laundry.

The lower diagram shows an optional shower area for farms that require employees and visitors to shower in and out of the barn. Substitute this for the shower are in the upper drawing.

# ELEVATED RESERVOIR WATERING SYSTEM

Here is a simple method of getting good quality water to your livestock from a pasture dugout. This arrangement prevents the animals from getting into the dugout and destroying the water quality (and the dugout). Once a week, you can fill the elevated reservoir with the gasoline pump. If you don't have time to wait for the reservoir to fill and to shut the motor off, either fill the gas tank with the right amount of gasoline so it just fills the reservoir or have an overflow back into the dugout. The water flows by gravity from the elevated reservoir to the stock tank, controlled by a float valve.



CATTLE WATERING SYSTEM – From a Pasture Dugout (summer only)

Dugout
Gasoline Pump
Elevated Reservoir (plastic lined) – one week storage
Stock Tank
Suction
Perforated Hose
1" water line
Float Control
Fence
Excavated Material
Excavated Material
Fence
Concrete Pad
Now thats service!
5' min

# GRAIN OVERLOAD IN CATTLE

The ingestion of large amounts of highly fermentable carbohydrate such as barley can cause severe problems for cattle not accustomed to these feeds. The terms used to explain this situation are carbohydrate engorgement, grain overload, founder and acidosis.

All types of ruminants are susceptible. It occurs most frequently in feedlot cattle on high grain rations or ruminants that suddenly eat large amounts of carbohydrate rich feed. Wheat, barley and corn are considered the most toxic when eaten in large quantities. All grains are more toxic when finely ground, rolled or just cracked. Processing increases the surface area and as such exposes more starch to the rumen microflora. Thus, digestion occurs rapidly.

The amount of feed required to produce acute illness depends on the kind of grain, the animal's previous experience with that grain, the animal's nutritional status and body condition and the nature of the microflora. Dairy cattle accustomed to heavy grain diets may consume 30-35 lbs of grain and develop only moderate illness while beef cows or feedlot cattle may become acutely ill and die after eating 10 to 15 lbs of grain.

The consumption of excessive quantities of grain is followed within 2 - 6 hours by a change in the rumen microbial populations. Once this occurs the rumen pH falls and the rumen stops normal function. High amounts of lactic acid are produced in the rumen and are responsible for the symptoms. The speed and onset of the illness can vary and ranges from:

Peracute - severely depressed, weak - usually die
Acute - off feed, depressed - consider immediate slaughter
Subacute - fairly alert, able to walk - will survive with proper treatment
Mild - alert, eats and drinks normally - no treatment necessary.

Most cases will require the assistance of a veterinarian as the necessary procedures and treatment require much expertise. Veterinarians will treat grain overload by

- Preventing further lactic acid production.
- Restore fluids and electrolyte losses and maintain blood circulation.
- Restore ruminal and intestinal mobility.

Mild cases may be treated by closely monitoring the animals situation and having them eat good quality hay.

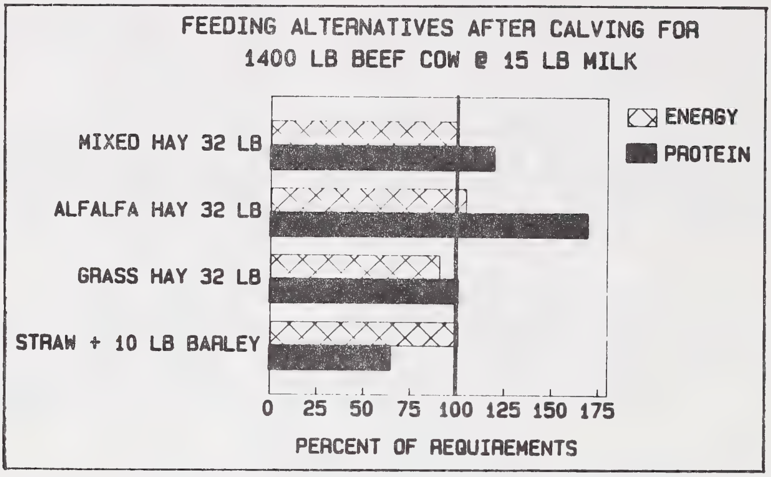
Grain overload in feedlot cattle has gained the most attention. Cattle can be started, grown and fattened on high grain rations successfully, provided they are allowed a gradual period of adaptation to high grain diets. Consultation with a veterinarian or someone trained in feedlot nutrition can alleviate concerns or possible problems. The factors that contribute to grain overload in feedlot cattle are:

- abrupt ration changes
- damp or wet feed
- inadequate bunk space
- too finely processed feed
- self feeders
- unbalanced rations
- sudden weather changes
- irregular feed deliveries
- improper ration mixing
- ground dry forage
- feed component separation

Most producers have had beef cows that have accidentally gorged themselves on grain. These accidents can happen for a number of reasons and many times are beyond prevention. Feedlot overload is a condition where the producer has more control and if managed correctly should happen minimally.

# AFTER CALVING RATIONS

The following table shows four feeding alternatives and how these alternatives meet the energy and protein needs of a 1400 lb beef cow producing 15 lbs of milk. In this example, all hays are fed at 32 lbs per day and the straw is fed free choice with an expected intake of 22 lbs per day. Average nutrient analysis for Alberta feeds was used in the calculation:


FEEDING ALTERNATIVES AFTER CALVING FOR
1400 LB BEEF COW @ 15 LB MILK

The table shows:

1. 1400 lb beef cows will need around 32 lbs of hay to meet their energy needs after calving. The level will be slightly lower for high quality feeds such as alfalfa hay and slightly higher for lower quality feeds such as grass hay. Free choice straw plus 10 lbs of barley grain will also meet her energy needs.

2. If feeding hay after calving, the ration likely supplies more protein than the animal requires. The exception is poor quality grass hay.

3. Straw plus barley grain rations must be supplemented with protein after calving. High quality legume hays or pellets, commercial 32% protein supplements or canola meal are examples of feedstuffs which are high in protein and suitable for after calving rations.

4. Saving the best quality feeds for late winter or for after calving is a good management practice.

5. There are many ways to feed a beef cow. Certain feeds can compliment deficiencies in other feeds. For example, rather than feed more grass hay or if hay is limiting feed 1 or 2 lbs of barley or oat grain or a range cube. Similiarly, straw free choice plus 10 lbs of alfalfa hay and 6.5 lbs of barley meets animal needs for protein and energy as does straw free choice and 20 lbs of alfalfa hay per day.

6. In addition, milking beef cows will need additional vitamins A, D and E, phosphorus and trace minerals such as selenium. A rule of thumb is that 100 cows will need 1 bag of fortified salt every 7 days and a bag of 18:18 mineral every 5 days. Cattle on predominant straw and barley diets will require additional calcium.

AC.1.811

# BEEF 'N' BACON

Alberta
AGRICULTURE

MAY - 1 1989

APRIL 1989 Vol. 4, No. 7

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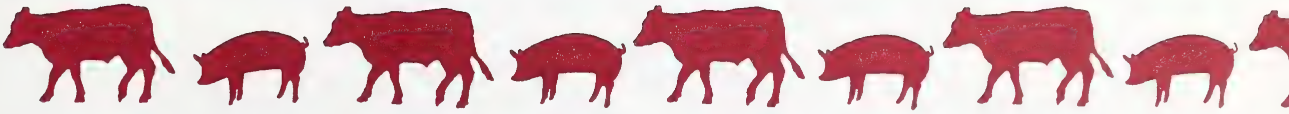

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# AT THE TABLE

## MODERATION, NOT MARTYRDOM

For years diet "experts", researchers, health care professionals, and government agencies have looked for ways to make our diet more healthful. Many people have rushed from one diet promise to another without satisfaction in the quest of easy answers.

Now, after all those years of experimenting with diets, health officials are still recommending an old fashioned balanced diet, eaten with restraint.

Calories, too many of them, and fatty acids, which deliver calories galore, now are widely recognised as the health culprits, not foods which may contain them. Caloric intake has more impact on blood cholesterol levels than the intake of either dietary cholesterol or fat. One of the most effective, but not necessarily popular ways to lower cholesterol is to lose weight.

Some authorities say that when you lower the fat content of your diet, you lower the cholesterol level of your blood. Keep in mind that fat is the richest source of calories, however, its' not so much the source as the total caloric intake that makes the difference.

Moderation, not martyrdom is the best advice when selecting a diet. Eat everything and not too much of anything. No single food causes or cures a disease. Your whole diet and lifestyle makes the difference.

# WHAT IS AN E.B.V.?

The Swine Improvement program (formerly ROP or Record of Performance), recently added EBVs to its reporting in addition to backfat and age to 90 kg figures. A brief explanation of what EBVs are all about is provided here.

Traditional backfat and growth figures (e.g. 13.0 mm fat and 150 days to 90 kg), reflect both environment and genetics. Also, each animal could perform differently under different management systems (e.g. the sellers vs. buyers premises). The buyer therefore, really wants to know the genetic value of a new boar or gilt before he purchases it, because a breeding animal with superior genetic value should ultimately produce better results regardless of the management system. EBVs attempt to do just that; give a genetic evaluation of a potential breeding animal which excludes the management conditions it was raised under.

Another limitation of the old ROP system is that it only looks at the performance of an individual animal. Breeders usually like to look at the performance of whole families. EBVs do this as well, since they look at the performance of sibs, sires and dams and progeny (if any).

As well, the new EBV evaluation system takes into account other factors such as the heritability of a trait, the amount of information available (i.e. numbers of litters, progeny), the amount of genetic competition within herds, and the genetic trends in the breed.

Therefore, buyers of breeding stock now have a comprehensive genetic evaluation for each boar and gilt that they can consult before buying breeding stock. The data presentation will be as follows:
Boar or Gilt XYZ:

| (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|---|---|---|---|
| Fat to 100 kg | Age to 100 kg | EBV Fat | EBV Age | EBV Index | % Repeat-ability |
| 11.6 mm | 140 days | -0.8 mm | -6.4 days | 139 | 52 |

The explanations are:

(c) EBV Fat: This is the genetic evaluation for fat. This states the relative merit of this pig compared to all others of the same breed and sex in the same area (e.g. western Canada). The -0.8 mm in the above example shows that this pig is genetically leaner by 0.8 mm compared to all others of the same breed and sex. A negative number is the desirable one to producers for leaner pigs.

(d) EBV Age: This is a similar genetic evaluation for age. Again, negative values are the desirable ones for faster growth. In the above example, the pig is genetically faster growing by 6.4 days to 100 kg, compared to all other pigs of the same breed and sex in western Canada.

(e) EBV Index? This can be used to show where the pig ranks compared to all the others of the same breed and sex by taking both traits into consideration. An index of 100 is the average for each breed and sex combination. A figure above 100 is desirable because it is above average. This index should not be confused with the market (grade) index.

(f) % Repeatability (Reliability): This is an estimate of how reliable the EBVs and the index are. As the EBV name states, it is an estimate. If an animal has only its own backfat and age measurement reported, this value is about 40%. If EBVs on the parents are included, it goes up to about 60%. If the animal was used as a sire or dam and progeny are tested, the reliability can go up to 90% or more.

# LIGHT UP YOUR PIGS

Under intensive confinement the pig's environment is dictated by housing and management practices. Most modern designs in pig housing prevent the entry of natural light with pigs soley dependent on management for artificial light. Many operators supply light only when they are working in the barn while others provide some level of light 24 hours per day.

## RECOMMENDED CODES

In recent years there have been increasing calls to safeguard animal welfare and be sensitive to animal behavioral needs. Lighting is one facet of the pig's environment identified by the "Recommended Code of Practice for Care and Handling of Pigs" (Agriculture Canada, Publication 1771/E, 1984). These codes recommend:

- Pigs not be kept permanently in darkness.
- Lighting be adequate (100 lux) to observe pigs (illuminance in a modern office is lux).
- For growing pigs the light and dark periods should each be not less than 6 hours per day.
- Breeding stock have 14 to 16 hours of light per day for estrus stimulation.

## PREFERENCE FOR LIGHT

Pigs kept completely in the dark except during feeding times have more lying behavior, less social behavior and less exploratory behavior. One recent study showed that although tail-biting damage was greater in brightly-lit pens, tail-biting and joint or leg problems occurs more frequently in pens of pigs kept in the dark.

Pigs given the opportunity to switch on or off lights by themselves demonstrate that their preference for light increases as the intensity decreases (see Table). Interestingly, operant behavior studies have found that pigs will readily operate a switch to turn on lights but will not turn them off.

LIGHT LEVELS PREFERRED BY PIGS 8 to 12 WEEKS OF AGE

| Light Intensity | Light demand over 24 hours | |
|---|---|---|
| | Hours | Time (%) |
| 100 lux | 12 | 54.3 |
| 10 lux | 15 | 62.6 |

Baldwin and Start, 1985.

## EFFECTS ON PERFORMANCE

Research has shown that:

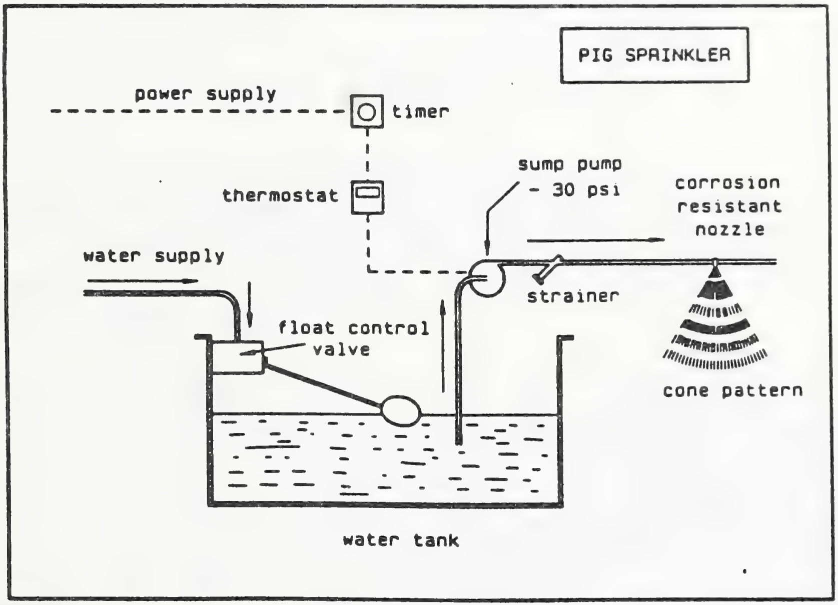
| | | |
|---|---|---|
| LACTATING SOWS | - | Supplemental light (16 hr/day) increases litter weaning weight by stimulating sow milk yield and increasing piglet sucking behavior. For every 10 lux increase, litter weaning weight increases by 140 grams. |
| BREEDING STOCK | - | Under certain conditions supplemental light (approx. 15 hours/day) can accelerate puberty in gilts and boars. |
| WEANING PIGS | - | To maximize feed intake, newly weaned pigs have a minimumn requirement of six hours of light of low intensity (30-50 lux) offered in two daily periods. |
| FINISHING PIGS | - | Lighting level or type is not known to affect pig performance. |

# HOW TO BUILD A PIG SPRINKLER

Grower pigs exposed to temperatures above 21 - 25°C will maintain feed intakes and grow faster when they have access to a shower or water sprinklers.

Upper Critical Temperatures (UCT)
for Pigs on Solid Concrete Floors - °C

| Live Weight (kg) 60-100 kg | dry skin | wet skin |
|---|---|---|
| maintenance ration | 32 | 36 |
| 2 x M | 29 | 35 |
| 3 x M | 26 | 34 |
| 4 x M | 23 | 32 |


PIG SPRINKLER
power supply
timer
thermostat
sump pump - 30 psi
corrosion resistant nozzle
water supply
strainer
float control valve
cone pattern
water tank

## Control Sequence

1) Thermostat turns power on when the temperature is above 25°C.
2) The timer runs the sump pump for 2-3 minutes every 45 minutes to 60 minutes.

### Nozzles

| Pigs/pen | Nozzle size |
|---|---|
| 10 | .40 gpm |
| 20 | .75 gpm |
| 30 | 1.12 gpm |

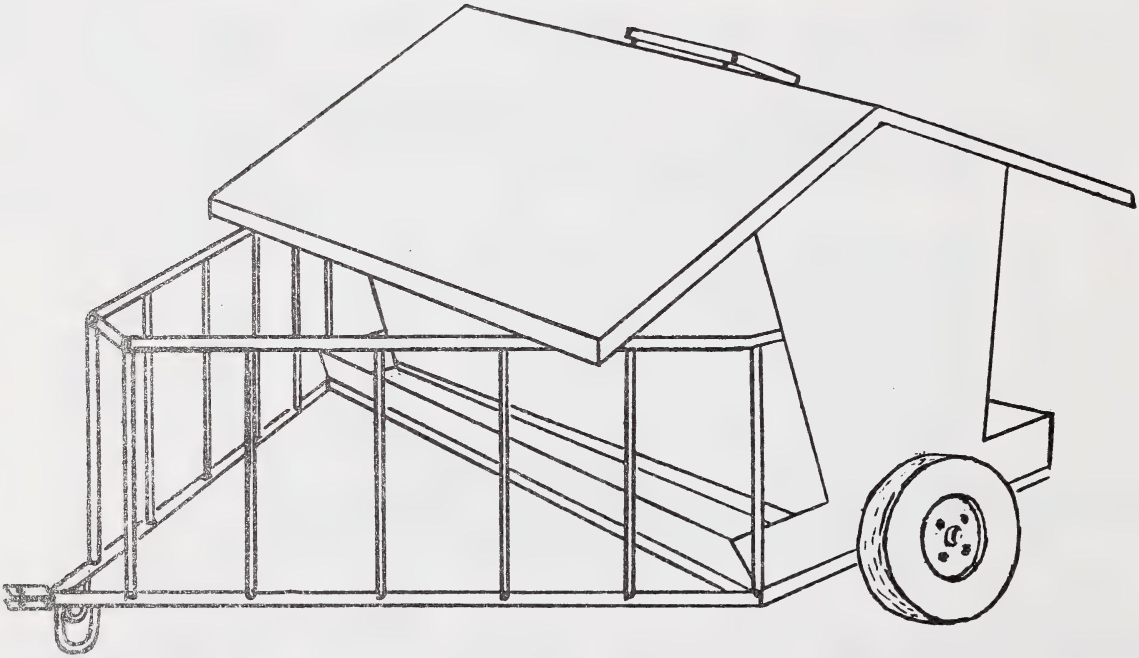
Use one nozzle per pen located 6 feet above the floor.

### Water lines

| Pipe size (inches) | Maximum flow (gpm) |
|---|---|
| 1/2 | 2.5 |
| 3/4 | 5 |
| 1 | 10 |
| 1 1/4 | 15 |
| 1 | 10 |
| 1 1/4 | 15 |
| 1 1/2 | 20 |
| 2 | 30 |
| 2 1/2 | 40 |
| 3 | 75 |
| 4 | 120 |

## PORTABLE CALF CREEP FEEDER

This self-feeder, built on a pipe frame and wheels, is easily transported from pasture to pasture. Calves enter through the 18" spaced bars. The back side of the feeder is used for minerals and salt for the cow herd.



# BREEDING SOUNDNESS EVALUATION

For the cow calf operator, reproduction is Number 1. It is considered 10 times more mportant than carcass traits and 5 times more important than growth rates. The more pounds f calf at weaning per cow exposed to breeding, the higher the potential income for the cow alf enterprise.

Both bull and cow fertility influence the eventual conception rate but an individual ull has a higher influence on overall herd fertility than does an individual cow. As uch, producers should consider breeding soundness evaluations on bulls both prior to urchase and prior to the breeding season. A breeding soundness evaluation includes:

1. An examination of internal and external organs. A veterinarian will palpate the bulls seminal vesicles and check the penis, and scrotum for abnormalities or infections. The seminal vesicles produce the fluid which surround the sperm cells. The penis is checked for abrasions, hair rings, lesions, warts or cancerous growths. The epididimis or sperm cords are checked for obvious swelling or lumps. The scrotum is checked for frost bite. Scrotal shape is noted.

2. The testicles are measured by determining the scrotal circumference. Scrotal circumference is an indication of potential sperm production from the testicles. All bulls should meet the minimum standard for their age. For example, an 18 month old Charolais bull must measure at least 34 cm. Bulls that do not meet the minimum should not be considered for breeding purposes.

3. The bull is ejaculated and sperm quality is determined via microscopical evaluation. The veterinarian will determine sperm cell structure (% abnormal and normal sperm) and sperm cell motility (% progressive forward movement of sperm). Sperm cell defects can be heritable or caused by the environment.

4. A libido test is not usually part of a breeding soundness evaluation test but is warranted. A standard libido test requires a pen with a stall to restrain either a cow or heifer. The bull to be tested is placed in the pen and observed for 10 minutes. The number of mounts, number of services and any deviations in the penis or failure to successfully service are recorded. The suggested quideline is 2 services for a mature bull and 1 service for a yearling bull within the 10 minute period.

A breeding soundness evaluation is not a guarantee of fertility but it does reduce the risk of a disaster. It can be considered as a picture of the bulls fertility that day. Yearling bulls may not pass a breeding soundness evaluation the first time and as such may require a second evaluation one month later. For bulls older than 15 to 16 months, the decision to cull can be based on the breeding soundness evaluation and discussion with the veterinarian.

# IS AN EVALUATION WORTHWHILE?

It is commonly thought that 5% of the bulls in use are non breeders (ie. sterile) and a further 25% are sub-fertile breeders. These figures are likely true since cow calf operators in the past have placed only little selection pressure on bull fertility.

## SINGLE SIRE BREEDING HERDS

In a single sire breeding herd there is a high risk of loss since the producer is dependent upon 1 bull to fertilize the entire herd. Based on the above non-breeding and sub-fertile figures, one would expect a sterile bull once every 20 years and a sub-fertile bull once every 4 years (or 5 times in 20 years). Further, experts suggest that a sub-fertile bull will settle only 20% of the cows per cycle compared to 75% for a "good breeder". The absolute minimum period to detect a sterile or sub-fertile bull would be 21 days or 1 estrus cycle. In practise, the time period will be longer. Based on a bull to cow ratio of 1:25, a 21 day delay in conception and calf gain of 2.5 lbs/day, then the absolute minimum loss would be 115 lbs per year. In reality the actual loss will be considerably higher since:

1. It will likely take longer than 21 days to identify sterile or non-breeders and replace with a good breeder.

2. A delay in conception one year, will delay conception for several years into the future.

As such, the actual loss will likely be 4 or 5 times higher than the absolute minimum estimate of 115 lbs per year. At $1.00 per lb for calves and $55 for an examination, there is a potential 9 to 12 fold return to a breeding soundness evaluation.

## MULTIPLE SIRE BREEDING HERDS

The potential loss in multiple sire herds will be less than in a single herd since the fertile bulls will breed a few extra cows. With the typical bull to cow ratio of 1:25, producers generally will never see a drop in conception rates if one of the bulls was either sterile or sub-fertile. The drop in conception rate becomes noticeable if 1) the sub-fertile bull is also the socially dominant bull and keeps other bulls away from breeding the cows or 2) there was more than one sub-fertile bull at any one time.

To achieve benefits from a breeding soundness evaluation in a multiple sire herd, one must look at herd size, the bull:cow ratio and potential changes in conception rates. For herds in excess of 125 cows where breeding soundness exams are used, the bull to cow ratio can be expanded. Rather than the 1:25 ratio, perhaps the minimum ratio can be 1:40 or higher. This ratio would still allow for sufficient bull power if one bull became injured or contracted footrot. Thus, the cost of a breeding soundness evaluation can be compared against a reduced annual bull maintenance costs and decreased risk associated with carrying sub-fertile bulls.

For mid-sized herds it becomes more difficult to change the bull to cow ratio and still allow for the risk of injury. A breeding soundness evaluation for mid-sized herds must be evaluated on the risk of a disaster (ie. several sub-fertile bulls in one season).

Regardless of the above, high fertility bulls will produce daughters (ie. replacements) that have potentially higher fertility rates than daughters from marginally fertile bulls.

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# BEEF 'N' BACON

Alberta
AGRICULTURE

MAY 1989 VOL. 4, NO. 8

CANADIANA

JUL 14 1992

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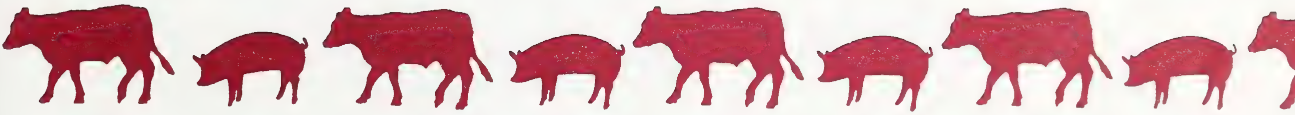

# INTRODUCTION

Beef 'n' Bacon was initiated in the fall of 1985 as a winter livestock program for the North West Region of Alberta. In 1987 it was expanded to include the North Central Region. The newsletter's objective is to reach livestock producers with timely and pertinent topics. It is not our intention to explain the subject matter in elaborate detail. Instead, we hope to spark your interest.

Issues of Beef 'n' Bacon are distributed to approximately 4300 livestock producers and agri-businesses in Alberta. It is written and edited from the Barrhead and Red Deer Regional Offices. District Comments (optional) are added by the District Agriculturist.

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Marvin Salomons, Swine Specialist
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427-2412 or 147-2412 (Rite)

# AT THE TABLE

## KEEP THE KNIVES AND CUTTING BOARDS CLEAN

Food-borne illness affects more than two million Canadians each year. The main bacterial cause of food poisoning is salmonellosis which is commonly found in uncooked meat. Food poisoning is rarely fatal, however, the costs in medical care, losses suffered by food producers, processors and food retailers runs into over a billion dollars each year. Usually the symptoms are mild and often people think they have the flu.

Salmonella is a natural bacteria found in most animals. People usually contract food poisoning from meat when they do not cook meat properly, e.g. hamburgers that are undercooked, or when the bacteria spreads from meat to utensils and cutting boards.

It is important to wash knives used for cutting raw meat in hot soapy water and then rinse before using the same knife to prepare other foods. Similarly, cutting boards should be kept meticulously clean. Special care should be taken to wash cutting boards and counters with hot and soapy water before preparing other foods, especially foods which will be eaten uncooked.

# TARGETING HOG FLOW AND RECORDS

Optimum production means careful planning of pig flow through an operation. Target production levels should be realistic and reflect the historical production figures for the operation.

For example, lets say we want to market 1800 pigs every year. This could be what your facilities can handle based on certain growth rates. To determine the number of farrowings needed every week, we could do the following calculations:

| | | |
|---|---|---|
| 1. Determine the number of market hogs you are capable of producing or would like to produce each year. | NUMBER OF MARKET HOGS | 1800 pigs |
| | + | |
| 2. Add to this the number of growing finishing pigs that will die in a year. | DEATH LOSS (G-F phase) | 18 pigs=1818 (1%) |
| | + | |
| 3. Add to this the number of weaner pigs that will die in a year. | DEATH LOSS (weaner phase) | 72 pigs=1890 (4%) |
| | + | |
| 4. Add to this the number of nursing pigs that will die in a year. | DEATH LOSS (on sow) | 216 pigs=2106 (12%) |
| | ÷ | |
| 5. Divide this total by the average number of pigs born alive per litter. | LITTER SIZE (born alive) | 9.5 = 221.7 |
| | ÷ | |
| 6. Divide this number by 52 to determine the number of farrowings needed per week to produce the required number of market hogs from Step #1. | NUMBER OF WEEKS PER YEAR | 52<br>= 4.3 |

No one can farrow 4.3 sows per week, but you can plan to farrow 4 or 5. The amount farrowing every week should be determined by the number of farrowing crates you have. Also remember that farrowing rate for your operation will determine the number you should breed every week in order to meet the targets.

For example: If 80% of sows that are bred actually farrow, your farrowing rate is 80%. If your goal is to farrow 4 every week and your farrowing rate is 80% you should be breeding 5 every week.

In the example above we use 1800 hogs marketed. With certain changes to management, we can easily change this hog flow. For example if our death loss is reduced we will ship more than 1800. If producing more than 1800 causes over crowding we could reduce sows or sell weaners or build. If we reduced our days to market by 2 weeks by a feed improvement or going to self feeders, we could produce more than 1800 hogs out of the same growing facilities. This means we could farrow more sows if our farrowing barn would allow.

Remember to set production goals for optimum hog flow through your operation. Monitor these targets through records and then act on the information to correct problems.

Adapted from Ontario Fact Sheet # 88-113

# INFORMATION SOURCES FOR SWINE PRODUCERS

| ALBERTA AGRICULTURE SPECIALISTS | SERVICES PROVIDED | LOCATION CODE* (SEE TABLE) |
|---|---|---|
| Swine Specialists | - production information<br>farm analysis/advisory | 1,3,4,5,7 |
| Swine Improvement Technicians | - home test programs<br>sow productivity | 1,3,4,5,6,7 |
| Swine Nutritionist | - ration formulation<br>feeding information | 8 |
| Swine Veterinarians | - disease investigations<br>herd health programs | 9 |
| Agricultural Engineers | - building planning/renovation<br>waste management | 1,2,3,4,5,6 |
| Farm Economists | - financial management and planning, tax strategies | 1,2,3,4,5,6 |
| Marketing Specialists | - market outlook<br>marketing alternatives | 2,3,6 |
| Farm Training Specialists | - green certificate training programs | 1,4,5 |
| District Agriculturists | - information on major programs and services | 66 District Offices in Alberta |

| *CODES | LOCATIONS | TELEPHONE NO'S. | RITE NO'S. |
|---|---|---|---|
| 1. | Regional Office, Lethbridge | 381-5130 | 181-5130 |
| 2. | Regional Office, Airdrie | 948-8503 | 172-8503 |
| 3. | Regional Office, Red Deer | 340-5376 | 151-5376 |
| 4. | Regional Office, Vermilion | 853-8109 | 141-1109 |
| 5. | Regional Office, Barrhead | 674-8264 | 134-8264 |
| 6. | Regional Office, Fairview | 835-2291 | --- |
| 7. | Pork Industry, Edmonton | 427-5320 | 147-5320 |
| 8. | Nutrition Lab, Edmonton | 436-9150 | 147-6361 |
| 9. | Health Management, Edmonton | 436-9343 | 147-3912 |

## MAJOR PROGRAMS

- SWINE IMPROVEMENT (Edmonton 427-5319)
  Record of performance and sow productivity programs

- SWINE A.I. (Leduc 986-1250)
  Artificial insemination information and fresh or frozen semen sales

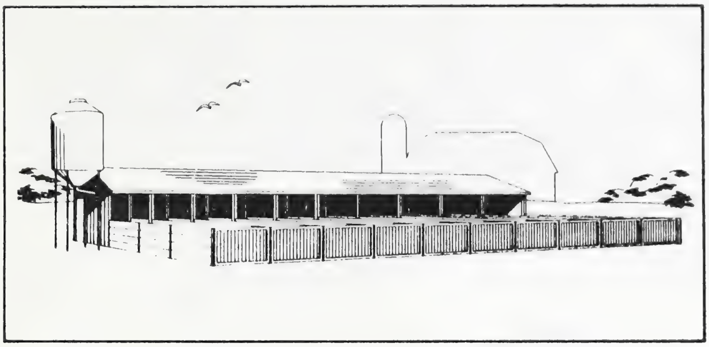
- HERD HEALTH (Edmonton 436-9343)
  Herd health programs for high health, seed stock and commercial categories

- DIAGNOSTIC SERVICES
  Feed testing: (Edmonton 436-9150)
  Veterinary Laboratories: (Fairview 835-2238), (Edmonton 436-8903), (Airdrie 948-6868), (Lethbridge 381-5190)

- TRIPARTITE RED MEAT STABILIZATION (Edmonton 422-0137)
  Federal - Provincial - Producer program to reduce market hog income loss

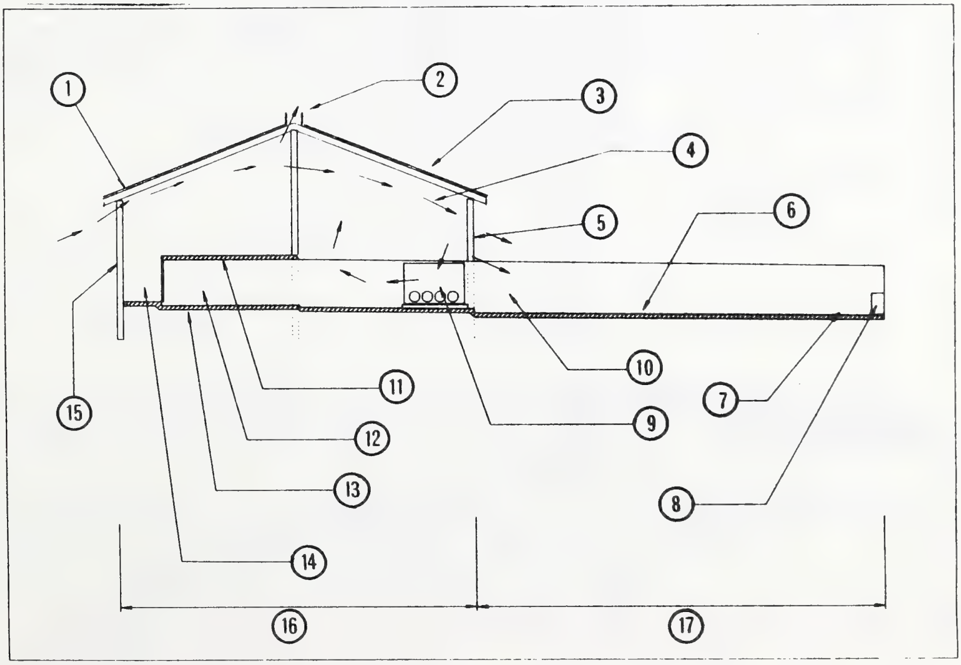
- CROW BENEFIT OFFSET (Edmonton 422-0015)
  Benefit feed grain users by reducing cost of feed grains.

# HOW TO BUILD A KENNEL HOG BARN



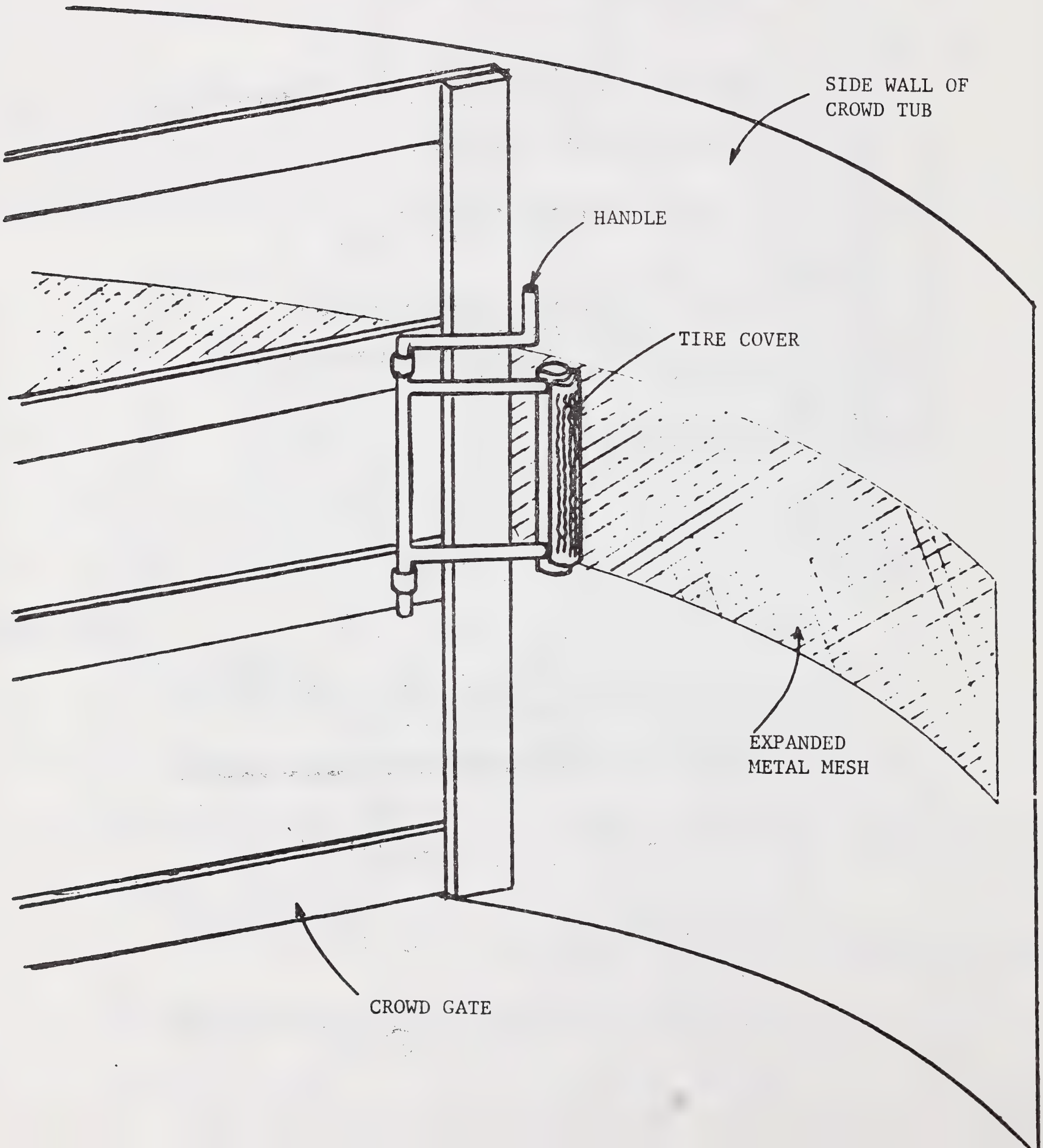
Kennel barns are cold, naturally ventilated barns than allow finisher pigs a choice of three environments - outdoors, sheltered under a pole barn (climate shell), or inside an isulated kennel.

1. Uninsulated open front pole barn. Opens eaves for ventilation.
2. Open ridge vent.
3. Check local snow loads for rafter design.
4. Air circulation pattern.
5. Open front.
6. High strength air entrained concrete floor.
7. Manure area. Gates at the front allow scraping.
8. Frost free water.
9. Self feeder.
10. Pens are 8' - 10' wide, 60' long. Use solid fences.
11. Cover over kennel. Store straw bedding here.
12. Kennel 8' x 12' with small door at the front, gate in rear.
13. Insulate kennel floor with styrofoam.
14. Handling alley.
15. Solid wall at rear.
16. 24' - 32' wide pole barn.
17. 30' - 34' outside pen area.



# CROWDING GATE LATCH

This design is one type of latch that can be used on crowd gates. When pressure is applied to the animal side of the gate, the rubber surface on the latch binds into the expanded metal mesh strip on the inside of the crowd pen wall. It is released by applying pressure on the gate from the handlers side. To swing the gate back, the latch is simply swung away from the wall with the handle.


SIDE WALL OF CROWD TUB
HANDLE
TIRE COVER
EXPANDED METAL MESH
CROWD GATE

# PROTEIN MEAL AS A CREEP FEED

Energy based creep feeds such as whole oats or grain plus supplement have been used for many years. They have resulted in increased weight gains, but have the disadvantage of over conditioning calves. This extra condition can reduce the market value of a weaned calf. Buyers are reluctant to pay for over fleshy calves since these calves can experience a compensatory loss in gain over the first month in the feedlot. To avoid early fattening, research and farm trials have been conducted with high protein creep meals. High protein creep meals have the advantage of increasing skeletal and muscle mass as opposed to fattening the calf. This practice would be of interest especially for purebred herds or commercial herds wanting to extend their pasture or increase weaning weights.

Research conducted in the U.S. has shown that supplementing relatively small amounts of a high protein feed (47% protein) to fall and spring born calves has significantly increased average daily gain and weaning weights. In these trials the feeding of either cottonseed or soybean meal at no more than one pound/head/day was cost effective. During the summers of 1987 and 1988 two trials were conducted in East Central Alberta to determine if these U.S. results could be duplicated in Alberta.

In Trial 1 (1987) 48 straight bred Charolais spring born calves (approximate weight 235 lbs.) were assigned to a control group (no supplement) or a treated group which had access to a creep feeder containing a 50:50 canola/soybean meal combination. This combination (Cansoy) was 42% crude protein. Both groups pastured native grass which had been divided into two equivalent sections by means of an electric fence. Calf weights were recorded at turnout and days 72 and 121.

In trial 2 (1988) 84 crossbred spring born calves (approximate weight 233 lbs.) nursing commercial crossbred cows were randomly assigned to treatments similar to Trial 1. Weights were again recorded at turnout and days 60 and 145.

Alberta High Protein Creep Meal Results

| | Cansoy Intake (lb/day) | Length (days) | Total Cost ($) | Weight Advantage (lb.) |
|---|---|---|---|---|
| TRIAL 1 | 0.53 | 121 | $ 9.00 | +44 |
| TRIAL 2 | 0.70 | 145 | $18.32 | +18 |

These trials demonstrate a significant weight gain advantage for the calves fed a high protein creep meal. The economic advantage, however, is dependant on a number of factors, one of which is the cost of protein meal.

From these trials it is evident that there is an alternative to the energy based creep feeds. Before choosing an energy or a protein creep however, it is advisable to consider your options including:

- the cost of creep feeding calves.
- the projected market price of weaned calves.
- whether the calves will be sold at weaning or kept to yearling age.
- available pasture conditions.

# 48 HOUR CALF REMOVAL

A Central Alberta Beef Survey of approximately 190,000 cows and replacement heifers showed that 26% of the beef herd calved later than day 42 from the start of calving. This figure is high. An easily obtainable goal for commericial herds is to have under 5% of the beef herd calving after day 42. According to J. N. Wiltbank from Brigham Young University, a short calving period is obtained by:

1. A nutrition program that ensures moderate body condition at calving. (condition score of 2.5)
2. A nutrition program that ensures that cows are gaining weight from 3 weeks after calving til 3 weeks into the breeding period. Weight gain at this time is difficult in good milking herds and for some beef herds will only be accomplished by feeding either grain or a range pellet.
3. A breeding soundness evaluation of all bulls.
4. 48 hour calf removal at the start of the breeding period.

The reproductive benefits to a 48 hour cow - calf separation are positive providing cows are in good body condition (condition score 2.5) and have calved at least 30 days prior. Cows will cycle from 24 hours to 5 days after the 48 hour separation. In one trial, 35% of the cows cycled within 24 hours after calf removal. The build-up of milk in the udder evidently triggers changes in hormonal levels which trick the body into believing that she has finished this lactation. As such, the cow shows heat. The time frame for calf removal can occur at the start of the breeding period or up to 3 weeks before. The initial estrus cycle after separation is usually of low fertility but on the next cycle the cow should conceive.

Not all cows need be separated from their calf. The target group for separation will be those cows calving after day 42 providing their calves are healthy and at least 3 weeks old. There is questionable benefit to separating cow and calf if the cow calved in the first 42 days. For example, in excess of 90% of the mature cows calving in the first 21 days will show heat in the first month of breeding compared to only 10% of the cows that calved in the 4th 21 day period. For first calf cows there may be increased benefits to a cow-calf separation since there are usually fewer young cows that show heat in the first 21 days of the breeding period. As such, the target group for calf removal in first calf cows might be those calving after day 30.

The calves can be penned together in a corral which does not allow across the fence suckling. Calves can be offered plenty of water and a good quality dust free hay. Whole oats or a commercially prepared calf meal can also be fed if desired. A trial reported by the Grain Growers (Agdex 420.435) states that each calf ate 1.9 lbs. of hay and 0.85 lbs. of concentrate pellets during the removal period. They report that calves lost an average of 5.7 lbs. during the 48 hour separation period but reported no problems with mothering up or scours, pneumonia, or other sicknesses. However, milk scours could be a problem for high milk producing herds as could pneumonia if calves are penned in dusty corrals or fed exceptionally dusty hay.

DEPARTMENT OF ANIMAL SCIENCE

UNIVERSITY OF ALBERTA

# 68TH ANNUAL FEEDERS' DAY

Featuring

# BEEF DAY

**Thursday, June 1, 1989**

AGENDA

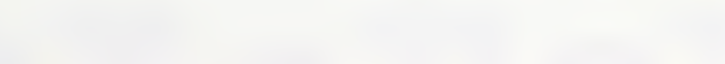
Farm Tours
Displays
Demonstrations
Technical Presentations
Barbeque

LOCATION

BEEF CATTLE TEST UNIT
ELLERSLIE RESEARCH STATION, EDMONTON
(2 miles west and 3/4 mile south of the
Ellerslie Elevator on Highway 2
in south Edmonton)

Advance registration for BBQ: $12 cheque payable to "Department of Animal Science", University of Alberta
Edmonton, Alberta T6G 2P5

For more information call: 492-3232



# DEPARTMENT OF ANIMAL SCIENCE

# UNIVERSITY OF ALBERTA

# 68th ANNUAL FEEDERS' DAY

## MORNING PROGRAM

| | |
|---|---|
| 9:00 a.m. | Registration<br>Coffee and donuts |
| 9:50 a.m. | Welcome - Mick Price<br>Chairman, Department of Animal Science<br>University of Alberta |
| 10:00 a.m. | Calving Difficulties in Beef Cattle - Mak Makarechian, University of Alberta |
| 10:20 a.m. | Forage and Grain Quality and Beef Cattle Performance - Gary Mathison, University of Alberta |
| 10:40 a.m. | Beef: A Low Cost Alternative to Venison - Bob Hudson, University of Alberta |
| 11:00 a.m. | Influence of Animal Activism on Current and Future Beef Production Practices - Mick Price, University of Alberta |
| 11:20 a.m. | Effect of Feed Additives and Implants on Growth, Carcass Composition and Safety of Beef - Gary Mathison, University of Alberta |
| 11:40 a.m. | Beef Research - Challenges and Opportunities for Alberta Beef Producers<br>George Schoepp, Alberta Cattle Commission<br>Roy Berg, University of Alberta |
| 12:30 p.m. | STEAK BBQ |

### DEMONSTRATIONS

Practical demonstrations on computer ration formulation, research techniques (such as blood, ruminal and intestinal sampling), feeding seeding systems, digestive physiology and much more.

### POSTERS

Poster presentations with latest research results on ammoniation of silage and grain, high moisture barley, grain preservatives, NIR, forage quality, etc.

## AFTERNOON PROGRAM

### EXPERT PANELS

Four panels to answer all your questions.

### FEEDING AND MANAGEMENT

Gary Mathison, University of Alberta
Ken Lopetinsky, Alberta Agriculture
Ed Thiessen, Thiessen Feedyards
John Basarab, Alberta Agriculture
Barry Robinson, Champion Feeds Ltd.

Chair: Dale Engstrom, Alberta Agriculture

### ANIMAL HEALTH AND WELFARE

Terry Church, Alberta Agriculture
Ben Thorlakson, Thorlakson Feedyards Ltd.
Larry Turner, Parkland Veterinary Services
Ron Weisenburger, Alberta Agriculture
Elizabeth Gredley, Alberta SPCA

Chair: Roy Berg, University of Alberta

### ANIMAL BREEDING AND REPRODUCTION

Laura Rutter, Alberta Agriculture
Glen Coulter, Agriculture Canada
Mak Makarechian, University of Alberta
Neil Harvie, Cochrane, Alberta

Chair: Chuck Huedepohl, Alberta Agriculture

### CARCASS AND MEAT QUALITY/SAFETY

Steve Jones, Agriculture Canada, Lacombe
Brian Glanfield, Agriculture Canada
Mary Jane Kilpatrick, Beef Information Center
Ruth Wood, Consumers Association

Chair: Mick Price, University of Alberta

### FORMAT FOR EXPERT PANEL

| | |
|---|---|
| 1:30 p.m. | Start of Program |
| 2:00 p.m. | Break to change sessions, view posters or demonstrations |
| 2:10 p.m. | Expert panels to re-convene |
| 2:40 p.m. | Break to change sessions, view posters or demonstrations |
| 2:50 p.m. | Expert panels to re-convene |

CANADIANA

# BEEF'N' BACON

Alberta
AGRICULTURE

## OCTOBER 1989

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Vol. 5, No. 1

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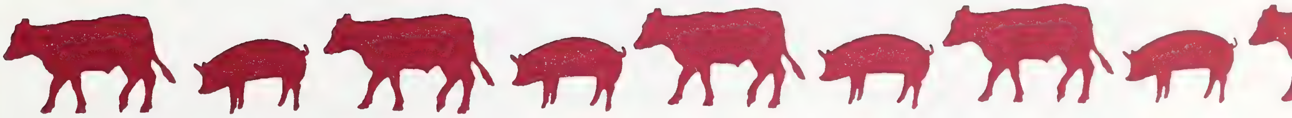

# INTRODUCTION

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# RED MEATS

## HAMBURGERS SHOULD BE WELL COOKED

Under-cooked meat can be the cause of a type of food poisoning commonly referred to as "hamburger disease" or "bar-b-que season syndrome".

This disease is caused most commonly by a bacteria called *E coli.* The bacteria produces a poison or toxin that damages the lining of the intestine and results in hemorrhagic colitis. Most people recover from the infection within two weeks; in a very small number of cases, the *E coli* toxin results in a serious, sometimes fatal complication called Hemolytic Uremic Syndrome or HUS. This illness affects the kidneys and blood and is especially dangerous to young children and the elderly.

As with most bacterial contamination of meat, it is almost exclusively the surfaces of raw meat that may harbour the bacteria. In the ginding process, surface contaminants will be spread throughout the uncooked ground meat product.

### What are the symptoms?

- Severe stomach cramps and bloody diarrhea two to eight days after eating contaminated food. Dehydration is common due to the loss of fluid.
- Fever is usually mild.
- Duration of the illness is seven to ten days.

### How do you avoid the disease?

- *E coli* is destroyed by cooking, pasteurization and safe food preparation.
- COOK ALL MEATS THOROUGHLY. The centre of hamburger patties should be brown, and juices should be clear.
- SERVE cooked meats immediately or keep them hot. Don't let cooked meats sit at room temperature.
- REFRIGERATE leftover meats as soon as possible after the meal. Reheat all leftovers thoroughly.
- REFRIGERATE or FREEZE meats as soon as possible after buying.
- THAW frozen meats in the refrigerator, not at room temperature.
- WASH hands thoroughly before preparing food, and after handling raw meats.
- PREPARE raw hamburger patties or other meats quickly, and either cook them right away, or put them in the refrigerator. Don't let raw meats sit at room temperature.
- WASH ALL utensils, cutting boards and counters with hot, soapy water to prevent bacteria from raw meats contacting other foods.
- PLACE cooked meats on clean plates. Don't re-use utensils, plates or platters that have been in contact with raw meats. Individuals with symptoms of hamburger disease should consult their physician.

# FEEDING SPROUTED GRAIN

This fall a lot of barley has come off sprouted with low bushel weights. The feeding value of these grains is discussed in this article. The principles in this article apply to hogs as well as cattle.

## SPROUTED GRAINS

Sprouting lowers the yield and bushel weight but the grain is not harmful to livestock providing it is stored dry. The amount of growth of the sprouts and whether all the kernels sprouted is an indication of the extent of loss in feed value -- the longer the sprouts and the more that's sprouted, the greater the loss. The feeding value of sprouted grain is similar to that of light weight grain caused by other factors.

## LOW BUSHEL WEIGHTS

Bushel weight is not a good indicator of feed value of cereal grains. Test weight is affected by many factors such as the shape and surface dimensions of individual kernels, but the differences are not reflected in nutrient content.

Research has shown that energy concentration of grains does not decrease in proportion to bushel weight. On average, the energy content of typical 50 lb. barley is no different than 48 or 46 lb. barley. Only with very low bushel weights, does energy value appear to fall.

As bushel weight drops, the fibre content rises which should mean a lower energy value. However, the rise in crude fibre is offset by a similar rise in fat which is high in energy.

**FIGURE 1:** **Effect of Bushel Weight on the Nutrient Content of Cereal Grains.**

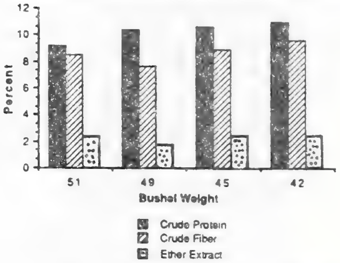


Table 1 offers guidelines for minimum bushel weights for cereal grains destined for use in swine diets. Grains of lower test weight can be used, but as indicated above, adjustments in nutrient content will be required.

**TABLE 1:** **Minimum Recommended Bushel Weights for Grains Used in Swine Rations.**

| Grain | Bushel Weights (lb) | |
|---|---|---|
| | Standard | Minimum |
| Barley | 48 | 45 |
| Wheat | 60 | 57 |

## CONCLUSIONS

- Bushel weights as low as 45 lbs for barley seem to have little affect on hog performance. Table 1 gives some guides for bushel weights of different grain. If light barley is less than 45 lbs., it should be fed to dry sows first and next to heavy feeder pigs.
- Care should be taken to ensure that sprouted grain is dry enough to store without molding.
- When feeding light grain, consult with your nutritionist for possible adjustments in nutrients so that premix and protein is not wasted.

Adapted from: Swine Nutrition Guide

# HERD TARGETS AND ACTION LEVELS

The success of your swine business depends on your herd's level of productivity. This will become more and more the scenario in the next few years. Good management practices which enable optimum use of your facilities with efficient throughput of sows and pigs is required. In order to assess your position collection of necessary production, health, and financial records is mandatory. Shown below are suggested targets that should be achieved with efficient production, together with the action levels where corrective measures should take place.

## Reference Data for Reproductive Efficiency and Piglet Mortality Per 100 Sows (28 Day Weaning)

| | Suggested Targets | Action Levels |
|---|---|---|
| No. of gilts available for service | 6 | 4 |
| Age at first service | 220 +/- 10 days | 240 days |
| No. of sows - productive | 100 | 95 |
| Weaning to effective service (days) | 7 days | 9 days |
| Repeat matings - Regular return (18-22 days) | 6 | 10* |
| - Irregular return (23 days+) | 3 | 5* |
| Empty days per sow | 12 | 14 |
| Abortion % | less than 1 | more than 1.5* |
| Sows not in pig % | 1 | more than 2* |
| Culled pregnant % | less than 1 | more than 2 |
| Deaths pregnant % | 1 | more than 2 |
| Farrowing rate % | 89 | 85 |
| Vaginal discharge - More than 7 days post service % | 1 | more than 1.5* |
| Sows culled per year | 38 | 42 |
| Sow parity at culling | 6-7 | 8 |
| Pigs born alive | 10.9 | 10.4 |
| Pigs born dead % | 5 | 7 |
| Piglets mummified % - less than 4" | less than 0.5 | 1 |
| Piglets mummified % - more than 4" | 1 | 1.5 |
| Piglet - losses % | 8 | 10 |
| Piglet - defective % | less than 0.5 | 1 |
| Piglet - laid on % | 3 | 5 |
| Piglet - low viable | 1 | 2 |
| Piglet - runt (starvation) % | less than 1 | 1.5 |
| Piglet - savaged % | less than 0.5 | 0.5 |
| Piglet - scour % | less than 0.5 | 1 |
| Piglet - other % | 2 | 2 |
| Piglets weaned per litter | 10.00 | 9.6 |
| Litters per sow per year | 2.35 | 2.3 |
| Pigs weaned per sow per year | 23.50 | 22.00 |
| Pigs sold per sow per year | 23.00 | 21.50 |
| Number of boars | 5 | 5 |
| Mean age | 21 months | 24 months |
| Age at culling | 3 years | more than 3 years |

* per 100 sows served

Adapted fronm: M.R. Muirhead, 1989

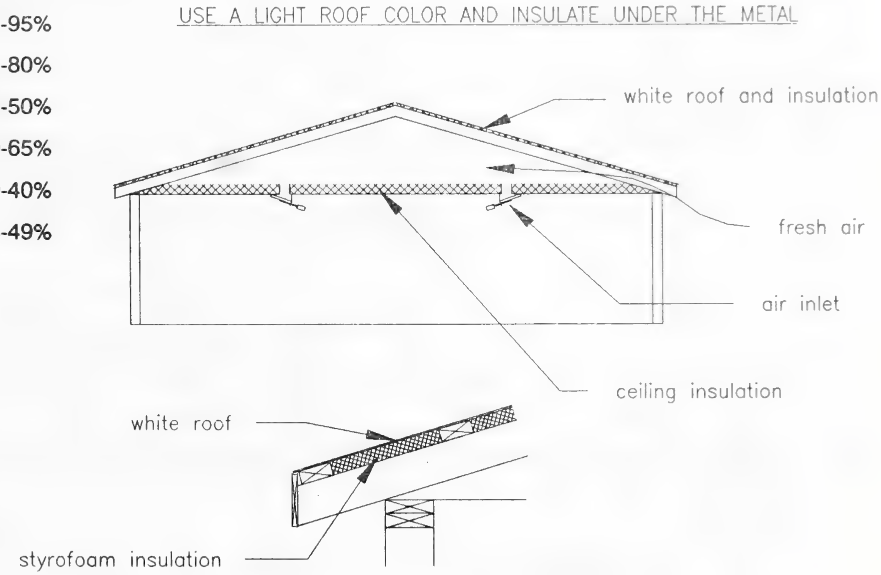
# HOW TO AVOID HIGH ATTIC TEMPERATURES

High attic temperatures in pig barns can be a problem in the summer, especially if fresh air that should keep the barn cool is preheated by a hot attic before it can reach the pigs. The principle of summer ventilation is to draw fresh air through the barn fast enough so that the pigs only have time to heat the air by 2° C.

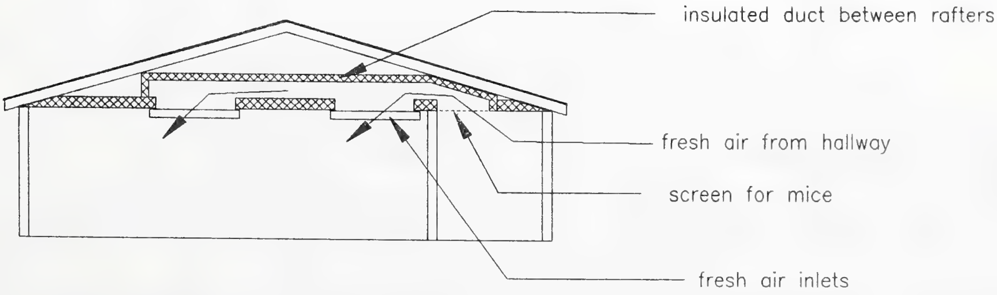
## Solar Energy Absorbed for Various Roofs

| | |
|---|---|
| black asphalt | - 85-95% |
| red tile | - 65-80% |
| whitewash | - 30-50% |
| galvanized steel | - 40-65% |
| Polished aluminum | - 10-40% |
| white painted surface | - 23-49% |

## Use a Light Roof Color and Insulate Under the Metal

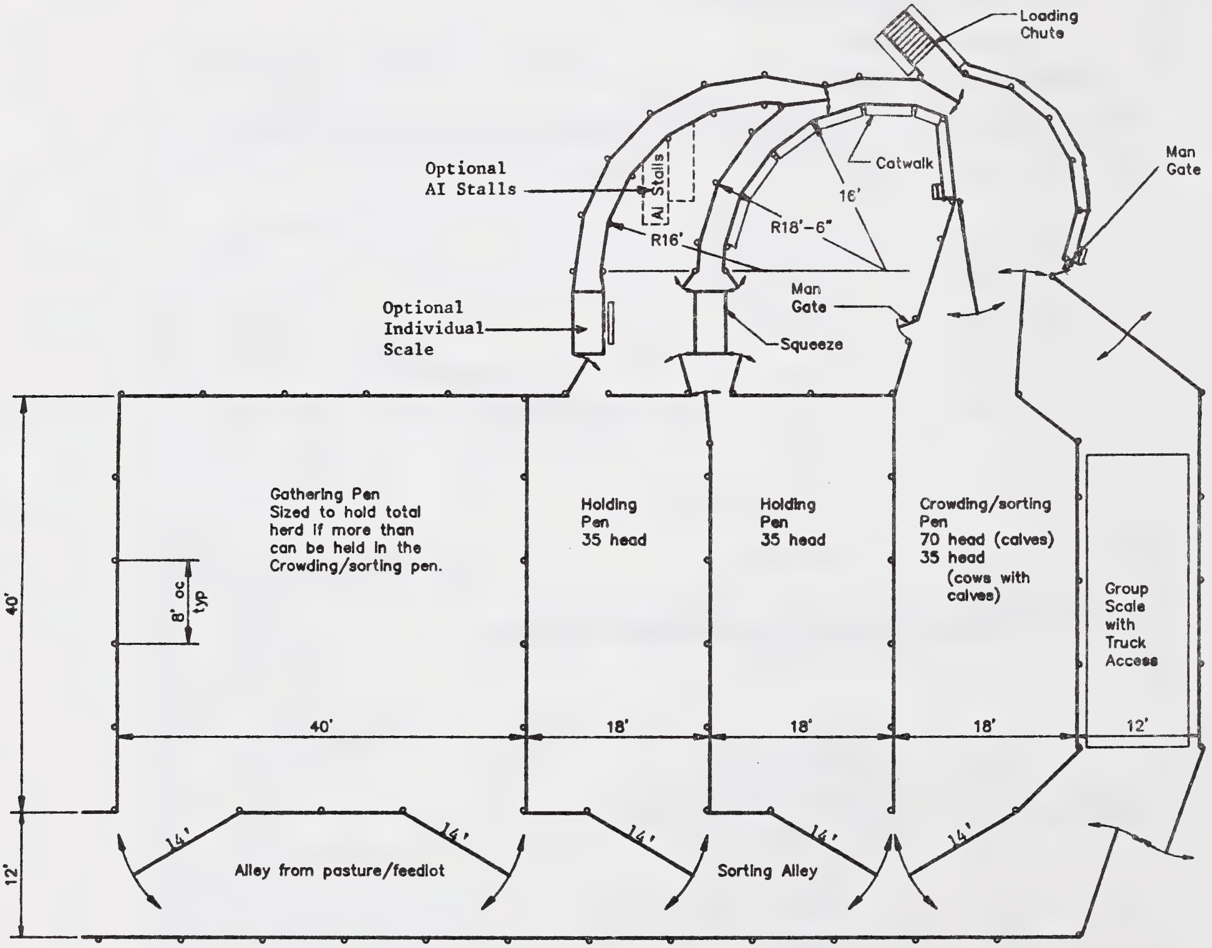

USE A LIGHT ROOF COLOR AND INSULATE UNDER THE METAL
white roof and insulation
fresh air
air inlet
ceiling insulation
white roof
styrofoam insulation

## Build An Insulated Duct From a Preheat Hallway


insulated duct between rafters
fresh air from hallway
screen for mice
fresh air inlets

# CATTLE HANDLING FACILITY WITH GROUP OR INDIVIDUAL SCALE

Shown below is a low cost, simple set of handling corrals that can accommodate a multipurpose platform scale. It allows for weighing trucks or bales as well as groups of animals. If preferred, an individual weigh scale or AI stall can be incorporated. This facility also employs an effective crowd tub and crowd gate along with a curved working chute. The scale can be built with a gathering pen, sized to fit the entire herd; it could be built next to a feedlot pen that could then be used as a gathering pen; or it can be built on its own if the herd size is 35 cows and calves or less.


Loading Chute
Man Gate
Optional AI Stalls
AI Stalls
Catwalk
16'
R18'–6"
R16'
Optional Individual Scale
Man Gate
Squeeze
Gathering Pen Sized to hold total herd if more than can be held in the Crowding/sorting pen.
8' oc typ
Holding Pen 35 head
Holding Pen 35 head
Crowding/sorting Pen 70 head (calves) 35 head (cows with calves)
Group Scale with Truck Access
40'
40'
18'
18'
18'
12'
12'
14'
14'
14'
14'
14'
Alley from pasture/feedlot
Sorting Alley

# ABORTION IN BEEF

One of the greatest concerns to any cow/calf producer is abortion. There are many factors involved in beef production and every producer's primary goal is to realize a live calf in the spring. Often due to one of a number of reasons a cow comes up open in the fall or slips a calf during the winter. A question to ask is was she ever pregnant and if so why did she abort.?

If she was never pregnant then infertility is obviously a problem and could have been the result of such factors as nutrition, poor bull performance (libido or physical limitations), poor heifer selection or even disease.

Abortions, however, can be quite alarming and it is estimated that 30-75% of them go undiagnosed (a cause was not determined). Some diseases such as vibriosis, trichomoniasis and BVD (Bovine Virus Diarrhea), cause death of the unborn calf during the first 90 days of pregnancy. In these cases the calf is usually resorbed by the cow, and abortion will not be evident. The cow will come back into heat and conceive up to 6 months after death of the fetus. The damage is usually not known until the time of pregnancy examination or calving. Open cows or delayed conception then becomes evident. If infertility or abortion problems occur contact your veterinarian. He will be able to assist you in determining where deficiency areas might be. Above all, however, a fall pregnancy check on all cows will help determine the soundness of your breeding program. The following is a list of the major causes of abortion (January, 1985 Grainews by Lori Hetland DVM).

# CAUSES OF ABORTION IN CATTLE

| | | | | Signs in | | | |
|---|---|---|---|---|---|---|---|
| Disease | Clinical signs | Abortion rate | Time of abortion | Placenta | Fetus | Diagnosis | Tests |
| **Brucellosis** | Abortion | Up to 90% | 6 mo.+ | Mushy cotyledons; leathery,opaque placenta | ±Pneumonia | Culture of festus, stomach, placenta, uterine fluid, milk and semen. | Serum tests available |
| **Trichomoniasis** | Infertility; return to heat at 4-5 mo.; abortion & uterus infections | 5-30% | 2-4 mo. | Uterine discharge with white flecks. | Fetus degenerating & uterine infection | Culture of fetus, stomach & uterine exudate | Cervical mucous agglutination test |
| **Vibriosis** | Infertility | Usually 5% may be up to 20% | 5-6 mo. | Semi-opaque placenta with small hemmorrhages & swelling | Flakes of pus on lining of abdomen | Culture of fetus, stomach, placenta & uterine discharge | Serum tests available |
| **Leptospirosis** | Abortion may occur at acute stage or later | 25-30% | 6 mo.+ | Yellow-brown cotyledons, swelling & pale placenta | Fetal death common | Culture of lung cavity, kidney & liver of fetus. Examine urine of cow. | Serum tests available. |
| **IBR** | Retained placenta<br>abortion | 25-50% | 6-8 mo. | No signs | Degenerated fetus | Culture of placenta & fetus | Serum tests available |
| **Fungal infections** | Abortion | Unknown 6-7% of all abortions | 3-7 mo. | Leathery areas on placenta; mushy, yellow cotyledons | May be ringworm-like lesions on skin hairless area | Examine cotyledon & fetal stomach, & culture, fetus, placenta | --- |
| **Listeriosis** | Cow may be sick | Low | 7-8 mo. | No signs | No abnormality | Culture fetal stomach, placenta & uterine fluid | Serum tests available |
| **Epizootic viral abortion (chlamydia)** | Herd immunity develops | High 30-40% | 6-8 mo. | No signs | Swelling of fetus; hemmorrhages on esophagus & trachea; liver degeneration | Culture chlamydia from liver, esophagus & trachea | --- |

**BVD - Bovine Viral Diarrhea** is being culture more frequently from aborted fetuses and may be a significant cause of abortion in cattle

**Nutritional** - ingesting excessive estrogens, very poor nutrition may cause abortion.

**Unknown** - from 30-60% of abortions are undiagnosed.

Adapted from table from Veterinary Medicine, Blood, D.D., Henderson, J.A., Radostits. O.M. 1980

# USING FARM GATE VALUE FOR CALVES PLACED INTO A HOME FEED LOT

Feeding your own calves may be more profitable than feeding purchased calves. The reason for this is the difference in farm gate value between your home raised calf and the exact same quality of calf purchased from an auction market.

Farm gate value is what the calf is worth in your farm feedlot after all expenses are paid or deductions from the sale value are estimated. The farm feedlot is a separate enterprise from the cow-calf operation. Use the farm gate value when calculating break-even feeder prices and deciding whether to feed the calves further or sell the calves.

Let's estimate the farm gate value for a home raised calf and a purchased calf of the same weight and quality. The following example shows how to estimate farm gate value for calves placed into a home feedlot.

| **HOME RAISED FARM GATE VALUE** | | **EXAMPLE** |
|---|---|---|
| Shrunk weight x Auction Market Price | | 475 lbs x $1.05/lb = $498.75 |
| Less: | Auction Commission Charge | 15.00 |
| | Alberta Cattle Commission | 1.50 |
| | Brand Inspection | .50 |
| | Transit Insurance (.15%) .0015 x $498.75 | .75 |
| | Other | 0.00 |
| | Trucking from Farm to Auction (25 miles) | 2.50 |
| | Farm Gate Value of Home Raised Calf | $478.50 |

(This $478.50 is the net dollars to the cow-calf enterprise if the calf was sold. The profit or loss in the cow-calf enterprise is separate from the profit or loss in the feeder enterprise.)

| **PURCHASED FROM AUCTION MARKET - FARM GATE VALUE** | | |
|---|---|---|
| Market Price | | 475 lbs x $1.05/lb = $498.75 |
| Add: | Buyer Costs | 5.00 |
| | Trucking from Market to Farm (25 miles) | 2.50 |
| | Other | 0.00 |
| | Farm Gate Value of Purchased Calf | $506.25 |

The farm gate value of the home raised calf is $27.75 lower than the value of the purchased calf in this example. The lower the cost of an animal placed into the feedlot the greater the profit potential. The difference between the home raised farm gate value and purchased farm gate value may be over $25.00 per head. This $25.00 may be the difference between a profit on feeding your own calves to a higher weight versus a loss on feeding the same quality calves purchased off the farm.

Do break-evens before you decide to keep calves or buy in calves for the home feedlot. Use the estimated **farm gate value** as the calf purchase cost or feeder purchase cost in break-even analysis.

Source: Jim Unterschultz, Regional Farm Economist - Vermilion

# BEEF 'N' BACON

Alberta
AGRICULTURE

## NOVEMBER 1989

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Vol. 5, No. 2

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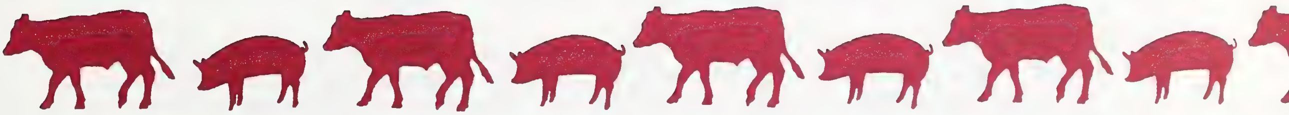

# INTRODUCTION

Beef 'n' Bacon is a winter livestock program for the North Central and North West Regions of Alberta. The newsletter's objective is to reach livestock producers with timely and pertinent topics. Beef 'n' Bacon is distributed to approximately 4,000 livestock producers and agri-businesses in Alberta. It is written and edited from the Red Deer and Barrhead Regional Offices. District Comments (optional) are added by the District Agriculturist.

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# RED MEATS

## PORK SLIMS DOWN

Since some pork products - especially bacon, sausage, spareribs and hot dogs tend to be higher in fat, pork has a dubious reputation but, in fact, many cuts of pork are 25% to 50% leaner than they were 25 years ago, thanks to changes in the breeding and feeding of hogs. Other pluses: the fat in pork is slightly less saturated than that in beef, and pork is an excellent source of B vitamins (especially thiamin), zinc, iron, and high quality protein.

### High-fat vs low-fat meat

| Meat (90 g or 3 oz, fat trimmed) | Calories | Fat(g) | % Calories from fat |
|---|---|---|---|
| Pork tenderloin, roasted | 148 | 4 | 22% |
| Pork center loin, broiled | 63 | 18 | 27% |
| Pork leg (ham), fresh, roasted | 233 | 7 | 27% |
| Pork, cured, ham | 128 | 5 | 35% |
| Pork spareribs, braised | 301 | 23 | 69% |
| Pork sausages, cooked (6) | 330 | 30 | 82% |
| Chicken breast, roasted, without skin | 142 | 3 | 19% |
| Beef, sirloin steak, broiled (lean only) | 163 | 6 | 33% |

Values from "Nutrient Value of Some Common Foods",
Health and Welfare Canada. 1988.

To keep pork lean and flavorful, try the following:

- Choose lean cuts, such as tenderloin, center loin, fresh pork leg or lean ham. Fattier cuts of pork (such as ribs, loin blade, and shoulder) and processed pork-based meats (sausage, bacon, etc.) - are still the most popular fare but can be hard to justify on a heart-healthy diet.
- Trim all visible fat before cooking.
- If you're trying to minimize your salt intake, avoid cured pork products such as bacon, ham and other cold cuts.
- Limit portion sizes - say 2 to 3 ounces or 60 to 90 g at a meal - so that your cholesterol intake won't be excessive. Pork, like all meats and poultry, contains 20 to 25 milligrams of cholesterol per ounce or per each 30 g, whether it's lean or fatty. Meat can go a long way in kabobs, sautes, and oriental stir-fry dishes.
- To keep lean meat moist, tender and flavorful, marinate it for several hours in fruit juice, honey, wine and/or sherry. Try seasonings such as thyme, ginger, rosemary, mint, garlic, fennel seed, or oregano.

# Baby Pig Chilling

It has been said that a new born pig starts to die as soon as it is born. Figure 1 illustrates this showing how disease, starvation and overlying (crushing) can often relate back to chilling after birth.

The lower critical temperature (LCT) of a new born pig is 34° C (93° F). The LCT is the lowest temperature where a pig feels comfortable. Below the LCT extra energy is needed to keep warm.

If deep body temperature drops by over 2° C, the piglet slows down and becomes lethargic. A lethargic pig is more likely to suffer from starvation and be crushed. If it survives, it becomes more prone to disease.

Figure 2 shows how drop in rectal temperature is related to the size of the pig, but even the largest pigs dropped nearly 2.5° C while the smallest pigs dropped about 5° C.

The dilema is that sows should be kept at around 18° C (65° F) but newborn pigs need 34° C (93° C). This can only be resolved using zone heating for newborn piglets.

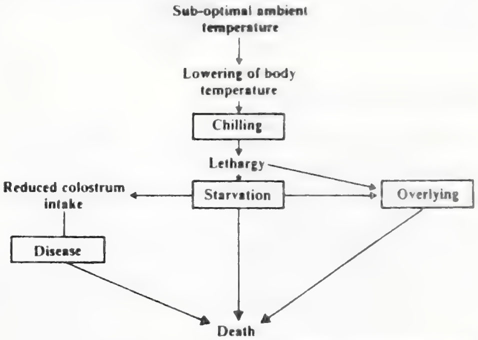
Figure 3 shows how this can be done using a heat lamp at the rear and both sides of the sow at farrowing. The rear lamp can be removed when farrowing is finished.

With totally raised and slotted farrowing crates, it is difficult to get the temperature up to 34° C with just a heat lamp. If the room is 18° C the temperature under the lamp is about 8° C more, making the temperature for the piglet around 26° C. This can cause chilling. A black rubber mat, carpet or bedding will help raise the temperature closer to 34° C. Use a thermometer to test whether the temperature is warm enough for the piglets and cool enough for the sow.

## Conclusion

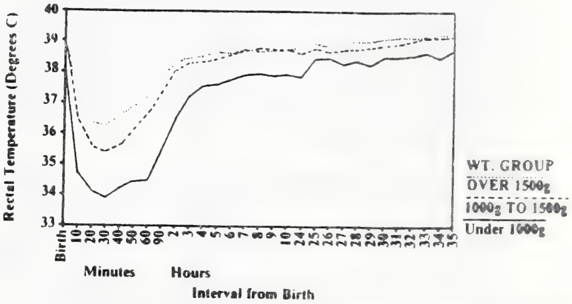
The environment of a piglet in the first hour of life can have a major impact on survival. A clean crate and sow, plus zone heating is necessary to maximize pigs per sow.

**Figure 1:** **Sequence of events in the chilling - starvation - overlying - disease complex.**



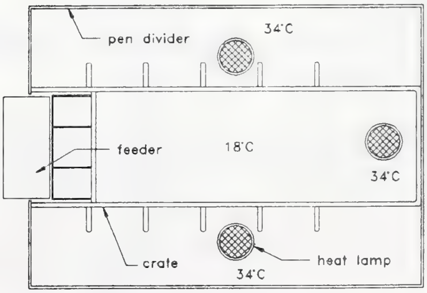
English and Morrison (1984)

**Figure 2:** **Rectal temperature trends from birth to 35 hours of age in relation to weight group at birth.**



Pattison, English, Macpherson & Birnie (1989)

**Figure 3:** **An arrangement of three heat lamps for a farrowing sow.**



# AD-LIBBING ON FEEDERS

No doubt some of you have heard about a different approach in feeding grower-finisher pigs. The new concept uses single space feeders. Single space feeders have become increasingly popular in Europe over the past two years and are now being made available to Alberta swine producers.

## THE CONCEPT

Video camera research into pig's feeding habits showed that when a four space conventional self-feeder was used pigs favored the two central feeding places. When the feeding spaces were reduced to two, the pigs ate primarily from one. These observations led to the single space version which was first marketed in the Netherlands in 1982.

## FEEDER SPECIFICATIONS

In Britain alone, at least 15 separate equipment manufacturers are now marketing single space feeders. Many different construction materials are used including polyproylene, PVC, stainless or galvanized steel, compressed fibre cement sheet and more. Intially, designs were the simple dry ad-lib type, but now wet/dry feeders are available both with ledge-type or nose-operated paddle feed dispensing systems.

Single space feeders are typically only 300 mm (12 inches) wide. As the name implies it is an ad-libitum feeder which allows only one grower-finisher pig to feed at a time. Most designs allow the pig to get its head and neck well into the trough area. This protects them from more dominant pigs positioned by the side of the feeder which is typically 300 to 400 mm deep. Depending on the model, feed hoppers hold from 10 to 40 kg of feed.

## WHAT ARE THE ADVANTAGES OR DISADVANTAGES ?

Similar to conventional wider self-feeders, trials with single space feeders have revealed improvements of 100 g/day in growth rate and up to 0.3 in feed conversion compared with floor feeding. Benefits have often been shown over conventional 1.2m (4 ft) self-feeders. The following table summarizes results from three trials conducted with pigs from 31 till 85 kg weight at the National Agricultural Centre in England.

| | Conventional (1.2m) | Single Space (300 mm) |
|---|---|---|
| No. pigs | 168 | 148 |
| Ave. daily feed (kg) | 1.81 | 1.97 |
| Ave. daily gain (g) | 715 | 794 |
| Feed conversion ratio | 2.54 | 2.47 |

Improvements in feed intake have been observed using single space feeders. Feed is always fresher using smaller hoppers plus single space feeder designs have reduced competition at the feeder. Water wastage can also be reduced by 50% where single space feeders are the sole source of water. Producers also have an advantage of freeing up 0.3 $m^2$ (3 $ft.^2$) of floor space when single space feeders replace conventional wider feeders. Space needs are also a consideration when contemplating a switch from floor-feeding to a self-feeding system.

Depending on your pig's genotype, the main drawback appears to be the potential of increased carcass fattness where improvements in growth rates are obtained when switching from floor feeding to self-feeding. Additionally, floor fouling has been observed where single space feeders replace floor feeding, particularily when the ventilation system is inadequate.

## RECOMMENDATIONS

- Optimum of 15 pigs per feeder. Although a maximum of 20 pigs per feeder is recommended some reduction in performance is likely.
- Two feeders per pen required with 20 to 24 pigs per pen. Additional water supply over the wet/dry feeder supply is recommended in this case.
- Feeder position on fully slatted floors is not critical but should be placed away from normal lying area preferably 1/2 to 3/4 way down the pen.
- Feeder position on partially slatted or totally solid floors should be between lying and dunging area. Depending on pen width feeder can face centre of pen or face the dunging area.
- Position for easy access for filling and inspection.

# HOW TO SIZE YOUR PIG BARN

You can calculate the number of pens and stalls required for a new barn or an existing barn using an approach based on litters per week of pigs born. One litter per week is 52 litters per year.

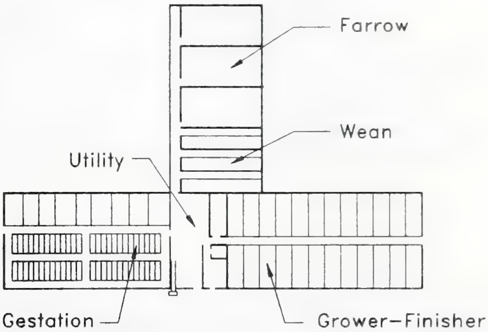
## Other Assumptions

- o 10 pigs per litter
- o pigs weaned at 4 weeks
- o pigs to market at 25 weeks of age
- o sows open for 2 weeks

You can use your own numbers and modify the following charts:

## 1. Herd size based on 2.17 litters/sow - year

| Litters/Week | Sow Herd |
|---|---|
| 1 | 24 |
| 2 | 48 |
| 3 | 72 |
| 4 | 96 |
| 5 | 120 |
| 6 | 144 |
| 7 | 168 |
| 8 | 192 |
| 9 | 216 |
| 10 | 240 |
| | (L/wk x 52/2.17) |



## 2. Gestation Barn

| Litters/Week | Gilts (20% Replacement) | Open Sows (2 Weeks) | Gestation Sows (17 Weeks) | Boars (1 Per Litter & 1 Replacement) |
|---|---|---|---|---|
| 1 | 5 | 2 | 17 | 2 |
| 2 | 10 | 4 | 34 | 3 |
| 3 | 14 | 6 | 51 | 4 |
| 4 | 19 | 8 | 68 | 5 |
| 5 | 24 | 10 | 85 | 6 |
| 6 | 29 | 12 | 102 | 7 |
| 7 | 34 | 14 | 119 | 8 |
| 8 | 38 | 16 | 136 | 9 |
| 9 | 43 | 18 | 153 | 10 |
| 10 | 48 | 20 | 170 | 11 |
| | (Sows x .2) | (L/wk x 2) | (L/wk x 17) | (L/wk + 1) |

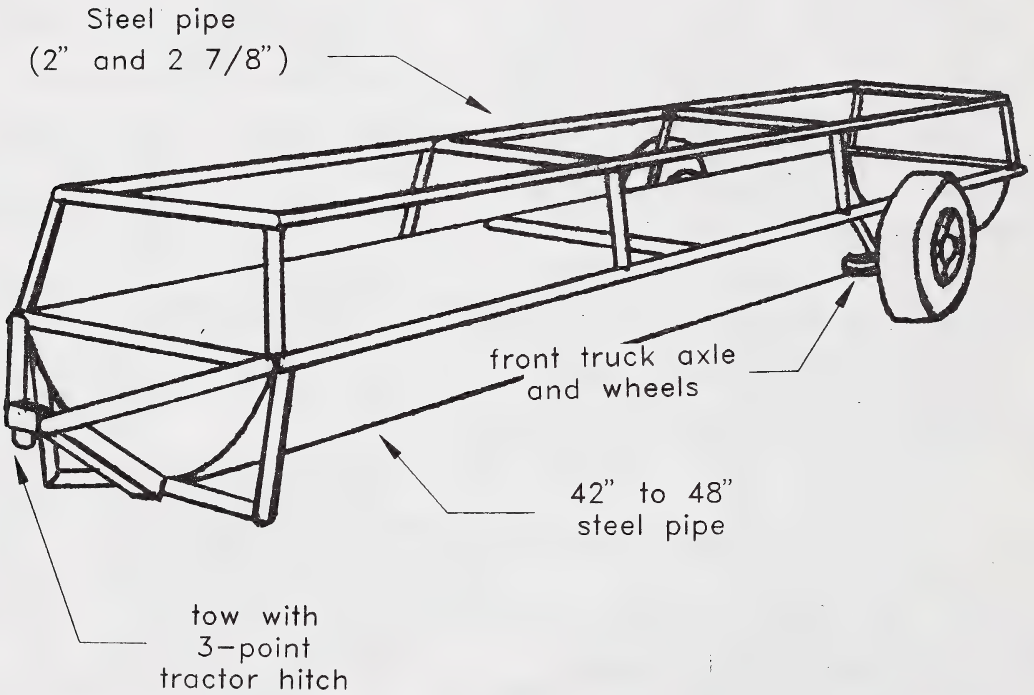
## 3. Farrow - Weaner - Grower - Finisher

| Litters / Week | Farrowing Crates (5 Week Cycle) | Weaner Pens (1 Litter/Pen) (4-9 Weeks) | Number of Grower Pigs (9-17 Weeks) | Number of Finisher Pigs (17-25 Weeks) |
|---|---|---|---|---|
| 1 | 5 | 5 | 80 | 80 |
| 2 | 10 | 10 | 160 | 160 |
| 3 | 15 | 15 | 240 | 240 |
| 4 | 20 | 20 | 320 | 320 |
| 5 | 25 | 25 | 400 | 400 |
| 6 | 30 | 30 | 480 | 480 |
| 7 | 35 | 35 | 560 | 560 |
| 8 | 40 | 40 | 640 | 640 |
| 9 | 45 | 45 | 720 | 720 |
| 10 | 50 | 50 | 800 | 800 |
| | (L/wk x 5) | (L/wk x 5)<br>2.5 $ft^2$/pig | (L/wk x 10 x 8)<br>5.2 $ft^2$/pig | (L/wk x 10 x 8)<br>8.8 $ft^2$/pig |

L/wk - litters per week
$ft^2$ - square foot

# PORTABLE SILAGE FEED BUNK

Here's an effective way of feeding silage to cattle that are some distance from your bunker silo. The frame is constructed out of 2 7/8 inch and 2 inch pipe with the "bunk" made from 42" to 48" diameter steel pipe cut in half. This is mounted on a front truck axle and wheels, and is towed with a 3-point hitch tractor. Large round bales can also be hauled to the feeding area by placing them on top of the framework.


Steel pipe
(2" and 2 7/8")
front truck axle
and wheels
42" to 48"
steel pipe
tow with
3-point
tractor hitch

SOURCE: TOM DODGSON, BARRHEAD

# FEEDLOT GROWER & FINISHER SUPPLEMENTS & PREMIXES

In order to minimize the cost per pound of gain on growing and finishing cattle it is necessary to feed balanced rations. This means that all the nutrients should be provided at an adequate level to meet the desired requirements of the animal. What we desire is often times more than the animal can deliver , so we must also be realistic. Balanced rations require the feeding of premixes or supplements which usually provide any nutrients not found in adequate amounts in the roughage or grain such as protein, minerals, vitamins and feed additives (Rumensin, Bovatec, MGA, etc.).

Supplements as we have become accustomed to, usually contain protein in combination with vitamins, minerals, etc. and is fed at a rate of approximately 0.5 - 1.0 lb/hd/day depending on the animals requirement. Premixes are fed at lower rates (approximately 0.3 lbs/day) and usually do not contain protein but have high levels of micro ingredients. They are relatively new to the feedlot industry but are now widely used.

In order to understand where a premix or supplement may be used the following examples are illustrated.

**Balanced rations require the feeding of premixes or supplements which usually provide any nutrients not found in adequate amounts in the roughage or grain such as protein, minerals, vitamins and feed additives (Rumensin, Bovatec, MGA, etc.).**

## Example 1

Producer has 550 lb. freshly weaned steer calves and wishes to feed them native hay and oats and would like them to gain approximately 1.5 bs/day. By feeding 11 lbs of hay and 5 lbs of oats energy requirements are met but protein, vitamins and minerals are still deficient. The addition of one pound of a 32% beef grower supplement makes up for these deficiencies and the ration is now balanced. If the producer had fed a higher quality roughage such as a legume/grass hay or silage, the supplemented protein would not have been necessary and a premix may have been used. One point to consider, however, is that a premix should only be used where there is the potential to mix it well into the feed. Due to its characteristics premixes are sold in the meal rather than pelleted form unlike supplements which are usually pelleted. Premixes may separate out so it is advisable to add oil or molasses to the premix/grain mixture.

## Example 2

Producer has 900 lb large frame feedlot steers; is feeding barley silage and barley grain and would like a 3.0 lb ADG.

By feeding 60% grain in the ration (13 lbs. silage and 19 lbs. barley) no supplemental protein is necessary. Calcium, trace minerals and vitamins are deficient, however. The addition of the proper finishing premix at 1.5% of the ration mix or 0.45 lbs/day will meet these deficiencies. One further advantage of a premix or supplement is that it allows the producer to utilize feed additives that can increase feed efficiency resulting in a lower cost/pound of gain.

Most of these additives however, are meant to be fed on a parts per million (mg/kg) basis. This means that the more feed the animal consumes the more additive is needed. By feeding the premix or supplement on a percentage of ration basis this is overcome.

It is important that nutrient requirements be met without being wasteful. For this reason premixes were developed and are proving to be very popular, particularly in cases where total mixed rations are fed.

* * *

The examples shown illustrate there is a place for both supplements and premixes in feedlot rations depending on the type of animal being fed and the producers mixing and feeding capabilities. It is advisable to consult with a feed company or Department of Agriculture nutritionist or livestock specialist to better assess your needs.

# Farm Scales

On any farm, there is certain equipment which is necessary for farming and other equipment which can can be considered optional. As agriculture develops and becomes more business orientated, one of these optional but perhaps now necessary pieces of equipment is the farm scale. The production and financial information that can be derived from a farm scale has been underestimated in the past but will be required in the future to keep that farm competitive. New designs incorporating load cells now allow for increased portability of scales, increased ease of use and increased accuracy.

## Here are some uses for farm scales

- Measure cereal crop productivity and determine if management practices are optional.
- Weigh hay bales or silage loads off the fields to determine productivity or response to treatments such as fertilizer.
- Weigh bales being sold or purchased and base price on actual weight rather than per bale. Calibrate farm grinder mixers or feed wagons to ensure the ration is formulated as desired. This could save expensive supplements or enhance animal gain.
- Weigh feed being fed to livestock and more accurately calculate costs of production. Monitor livestock performance over time to determine gain and more accurately predict costs of production and marketing dates or determine needed changes to management to meet goals.
- Provide market information on sale weight of livestock prior to offering for sale and more accurately project cash flow.
- Bring trucks up to tare weight so that trucking costs can be reduced.
- Better assess feed inventory and more accurately project surpluses or deficiencies.

These above uses all have financial implications in that they provide the manager with needed information to make the best decision.

## Let's use an example of selling calves:

The calf buyer estimates your 50 calves weigh 625 lbs. (after shrink) and offers $1.00/lb. You calculate that, after deductions of $200.00 for trucking, you would get $31,050.00 and agree to sell the calves. When the calves were weighed at the buyer's scale you find the actual weight was not 625 lbs. but 605 lbs. Your cheque (after trucking) came to $30,050.00 - $1,000.00 less than expected. Further, you realize that 605 lb. calves should bring 1/2 ¢ to 1 ¢ per lb. more than 625 lb. calves. Question: Did you have the best information available? Weighing the calves at home and calculating a pencil shrink would have given a much better indication of sale weight. It would also have given you a better idea of what price to accept.

Here is another example, this time with hay bales:

The going price for your quality of hay is $35.00 per ton. A hay buyer offers $20.00 per roll. Question: Is $20.00 per roll the equivalent of $35.00/ton? Perhaps, but the question will not be answered unless the bales are weighed.

| Bale Weight (lbs.) | $/Roll | $/Ton |
|---|---|---|
| 1100 | $19.25 | $35.00 |
| 1200 | $21.00 | $35.00 |
| 1300 | $22.75 | $35.00 |

These examples illustrated that farm scales can be a valuable piece of equipment. Basing decisions on actual production rather than an estimate should ultimately enhance profitability.

AL.1.811

CANADIANA

# BEEF 'N' BACON

Alberta
AGRICULTURE

## DECEMBER 1989

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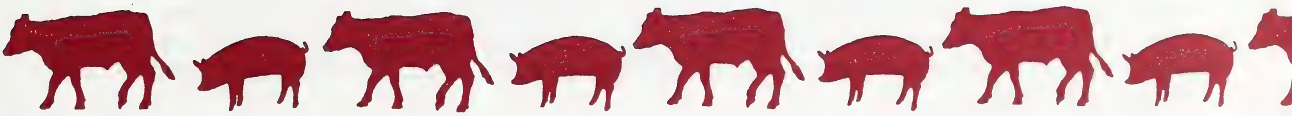

# INTRODUCTION

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# RED MEATS

## WHO'S PROTECTING THE FOOD SUPPLY?

Recently, consumers have become concerned by potential health risks from pesticide residues, product tampering and scattered outbreaks of foodborne illness.

Extensive safeguards against such risks have helped maintain an impressive safety record for many years. Ironically, that record, combined with little awareness among consumers of how it has been achieved, may have magnified recent concerns. Consumers justifiably expect government is responsible for monitoring and regulating the origin, composition, quality, safety, measurement, labelling, packaging, marketing, and distribution of food.

At every stage of production, the food industry follows standards of good manufacturing practice established by a team of government agencies.

For example, on the cattle ranch, the use of antibiotics in animal feed and other biological agents are administered by the producer following instructions that have been carefully tested and reviewed. To market foods today, a producer must accept a prominent role in assuring food safety.

Slaughterhouses and processing plants must maintain proper sanitary conditions, and have in place systems to assure that contaminated meat does not come to market.

Food processors must maintain rigid temperature and sanitary conditions, as must wholesalers and distributors.

Finally, retailers must meet government standards for cleanliness, storage conditions and product removal after expiration.

When it comes to food safety, consumers themselves are a critical link to success. Unlike other links in the food chain, consumers are not regulated, organized, and they are not trained. A recent U.S. survey has shown that while preparing food at home, consumers rinse or wipe their hands only 25 percent of the time and clean knives and cutting boards at the same low rate. Food safety in the home is dependent on following accepted recommendations for storing and cooking food and high standards of cleanliness being maintained by those preparing the food.

Written by : Aileen Whitmore

# MAKIN' BACON

Attaining more than 2.2 litter per sow per year is only possible using good breeding practices.

In order to get good conception rates, a number of criteria need to be met.

1. A fertile boar that is willing and able to breed.
2. A breeding area that allows the boar and sow good footing.
3. Proper timing: A sow releases her eggs and becomes pregnant toward the end of heat.

## The Boar

The boar is half the herd and should be treated with a lot of tender loving care. Boars constantly housed in dirty pens on cold cement quickly become stiff and arthritic with reduced performance. Warm concrete, a rubber mat, ashphalt or bedding will help keep boars more comfortable. A dirty boar increases the risk of passing infection into the female. The easiest way to keep a boar clean is keep the pen clean.

Boars need a balanced ration for strength and semen production. A 14% protein dry sow ration balanced for minerals and vitamins is adequate for boars. Keep boars in good shape but not fat.

Sows should be mated twice using two different boars for improved litter size and conception rates. Ten or twelve single boar matings might be enough to find a boar throwing very small litters (7 or less pigs). But to prove a boar is throwing a 1/2 or 1 pig less would take hundreds of single boar matings and is not worth it. The best approach would be to use a new mature boar on single boar matings for a few months and then continue with team matings using two or more boars per sow.

## The Breeding Area

The breeding area should provide good footing for the boar and sow with rounded corners to prevent sows putting their rear ends into a corner. For inside breeding areas, a sand or dirt pen that is only used for breeding will ensure more successful matings with less slipping and less injuries. Boars are also more confident if they know the footing is good.

Outside hand mating systems should also have a dry non-slippery area for breeding. A well-bedded pen will work satisfactorally in outside systems.

## Supervised Matings

High conception rates, and good breeding records are only possible if all matings are supervised. Supervised or hand mating means that the operator watches the matings making sure the boar is at the right end and the penis is in the right location.

In pen mating systems where the boar is free to breed at any time, the operator never knows the breeding schedule. Records on thousands of sows comparing farrowing rates show that pen mating systems will consistantly have lower farrowing rates than supervised systems.

## Timing

A sow will be in standing heat for about two days whereas gilts are more variable but on average have a shorter heat. Sows should normally be bred twice 24 hours apart while gilts should be bred twice 12 hours apart. This can vary between herds and is related to management and heat detection methods.

## Conclusion

Paying attention to detail such as supervised matings, good footing at mating, proper timing, and having boars that want to breed will ensure high conception rates and plenty of pigs.

Written by: Bert Dening

# TAIL-BITING - - A PAIN IN THE BUTT

Untangling a tail-biting problem is not simple. In some herds this behavior is a persistent serious occurance whereas other herds rarely have to deal with it at all. In most situations where a problem arises there is no simple answer or single solution in rectifying the behavior. Often a tail-biting outbreak may start or stop without the manager determining the exact cause of the problem, but researchers today are getting closer to understanding why it happens and how to deal with it.

## CAUSES

Tail-biting is sometimes called the "anti-comfort syndrome" because any part of the pig's environment that makes the pig uncomfortable may trigger tail-biting. Listed in the table shown below are factors that have been shown or claimed to cause tail-biting. As one notes, the list resembles everything that could go wrong in raising pigs.

Large groups
Crowding
Hunger/Thirst
External parasites
Noise
Stray voltage
Genetic predisposition
Boredom
Nervousness
Poor ventilation
High humidity
High temperature
Low temperature

Drafts
Sudden diet change
Low protein
Low fibre
Improper amino acid ratio

Deficiencies of:
- vitaminis
- iron
- copper
- calcium
- phosphorous
- magnesium salt

Fraser, 1989

## UNDERSTANDING THE PROBLEM

David Fraser, an animal behaviorist at the Animal Research Center in Ottawa has suggested that the process of tail-biting can best be viewed in the following three stages:

### 1. Recreation stage

The first stage is characterized by quiet low-key chewing and nibbling and is generally tolerated among confined pigs. Pigs by nature like to root and chew. The lack of objects in the pen environment makes the bodies of pen-mates obvious outlets for recreational chewing.

Pigs generally spend 80% of their time resting and 10% eating and drinking. The remaining 10% is active and unoccupied time. Disturbances that increase stress and pig discomfort and reduce resting time leaves more time for active behavior and hence potential trouble. Responses to stress factors are known to vary between pigs, pens and herds.

### 2. Tramatization stage

The second stage occurs where chewing somehow causes tissue damage or bleeding. In some groups these minor injuries heal without further incident. Pigs generally view tail-chewing as low-level aggressive interaction and allow their tails to be chewed without registering pain. In this stage the behavior is often allowed to go too far especially in pigs that are sick or fatigued.

### 3. Escalation stage

The final stage arises as the behavior escalates rapidly from the previous level until pigs have severely bitten tails and are pursued by persistent biters. Stress plays an important role in this stage as external environmental factors and the pigs' own physiological reactions may increase its attraction to tail-biting. Research has shown that certain pigs have a strong attraction to blood and do the most biting. Low dietary salt or physiological stress may increase the pig's appetite for salt. Salt in blood is an attractive means of satisfying this need.

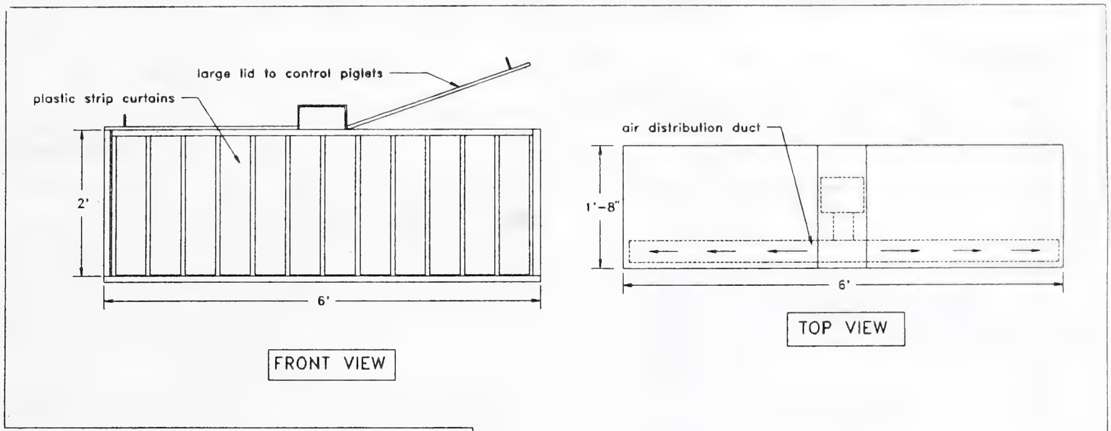
## PREVENTING AND CONTROLLING OUTBREAKS

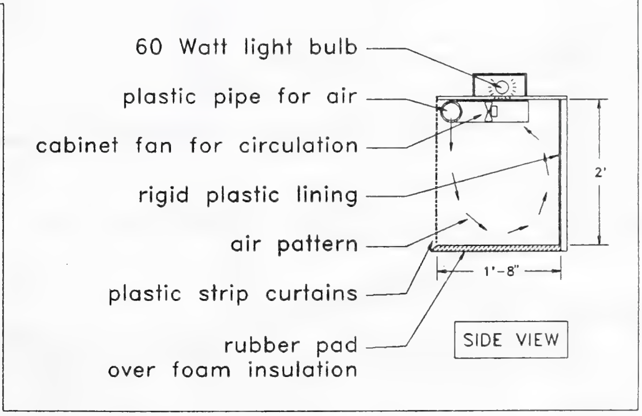
- Minimize stress and maximize pig comfort. Maintain adequate environmental space and dietary needs. Maintain salt levels at 0.5%
- Provide outlets for chewing such as pig toys, tires, or even small amount of straw.
- Remove sick or bullied pigs from pens as these pigs often allow recreational chewing to escalate.
- Remove tail-bitten pigs immediately. Provide straw in the hospital pen to reduce biting activity

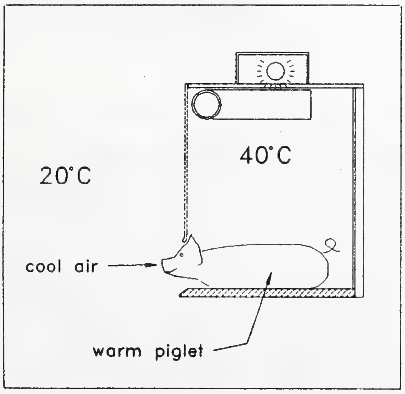
Written by: Marvin Salomons

# HOW TO BUILD A WARM PIGLET CREEP BOX

Small, wet piglets need a warm dry environment immediately after birth. A temperature of 38-40°C during the first few days will prevent the 10-15% losses common among new born piglets. The piglets would like to breath cool air however, and have a chance to choose their environment. The drawing shows a concept developed in West Germany, a warm box located next to the sow that provides a warm bed yet allows the piglets a supply of cool air to breath. The sleeping piglet can lay in the warm box with its head extending outside the box, much like a pig in a straw stack! For suckling the pig just comes out of the box into the cooler air next to the sow. A person walking by the box will see a row of noses sticking out of the plastic flaps.


large lid to control piglets
plastic strip curtains
2'
6'
FRONT VIEW
air distribution duct
1'-8"
6'
TOP VIEW


60 Watt light bulb
plastic pipe for air
cabinet fan for circulation
rigid plastic lining
air pattern
plastic strip curtains
rubber pad over foam insulation
2'
1'-8"
SIDE VIEW


20°C
40°C
cool air
warm piglet

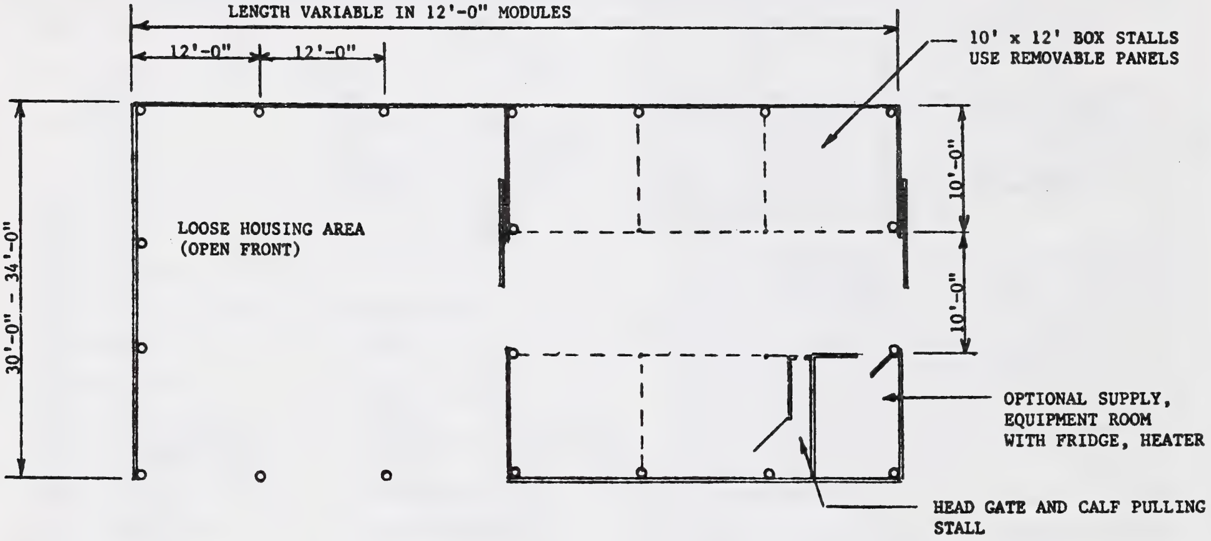
### IDEAL CLIMATE

| Sow | Newborn Piglet |
|---|---|
| | around body: |
| 18-22° C | 38-40° C |
| 60% relative humidity | 30% relative humidity |
| | air to breath |
| | 18-22° C |
| | 60% relative humidty |

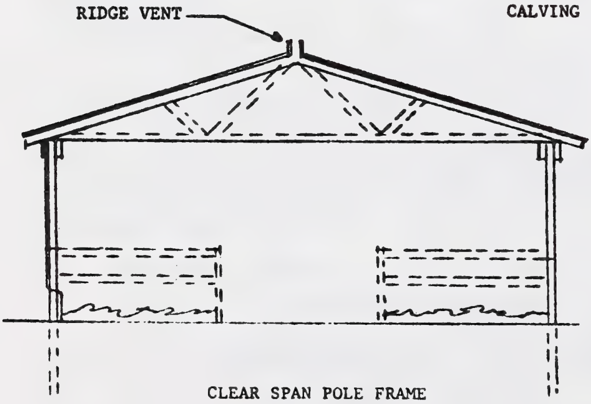
Written by: Robert Borg

# CALVING BARN

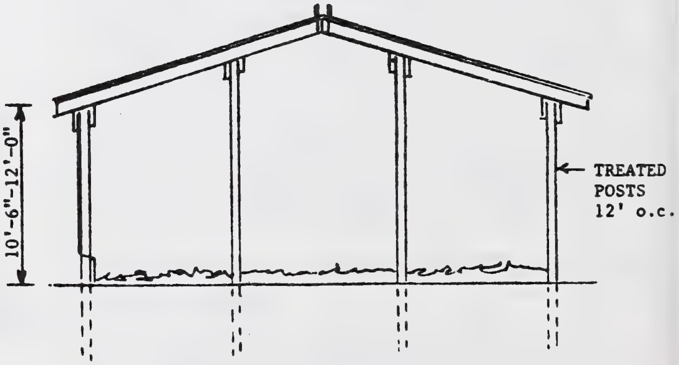
Every spring, cattlemen experience losses at calving, many of which could be avoided by having good calving facilities. A pole frame structure makes a low-cost calving barn. Minimum pen sizes are 10' x 10' with 10' x 12' or 12' x 12' being preferred. If pen panels are removable, the whole barn can be easily cleaned. The barn can either be uninsulated and naturally ventilated or it can be insulated and mechanically ventilated.


LENGTH VARIABLE IN 12'-0" MODULES
12'-0"
12'-0"
10' x 12' BOX STALLS USE REMOVABLE PANELS
30'-0" - 34'-0"
LOOSE HOUSING AREA (OPEN FRONT)
10'-0"
10'-0"
OPTIONAL SUPPLY, EQUIPMENT ROOM WITH FRIDGE, HEATER
HEAD GATE AND CALF PULLING STALL

CALVING BARN LAYOUT



CLEAR SPAN POLE FRAME


10'-6"-12'-0"
TREATED POSTS 12' o.c.

POLE FRAME THROUGHOUT

Written by: Wayne Winchell

# IS CUSTOM FEEDING AN ECONOMIC ALTERNATIVE?

Custom feeding is defined as the practice of putting cattle in a feedlot operated by another individual (or company) and paying them for backgrounding or finishing the cattle, rather than selling the cattle as feeders or feeding them on one's own farm.

The economics of beef production depend on costs and returns and in a custom feedlot can be broken into three areas.

- purchase price
- feed expenses
- other expenses

## Purchase Price

Purchase price is a key factor and can easily mean the difference between profit and loss. A break even purchase price should be calculated initially to determine if there is an opportunity for profit.

$$BEPP = \left[(SP-C) \times \frac{SW}{PW}\right] + C$$

$$\text{Example: } BEPP = \left[(.85-.65) \times \frac{1150}{600}\right] + .65 = 1.03$$

BEPP = Break even purchase price,
SP = Selling price (cents/lb),
C = Total cost of gain (cents/lb) including feed, interest, yardage, drugs, death loss and veterinary costs,
SW = Selling weight (lb) adjusted for shrink,
PW = purchase weight (lb) adjusted for shrink.

## Feed Expenses

Feed expenses are one of the most important variables as it represents 70 - 75% of the total cost of gain. Custom feed lots normally feed a series of rations consisting of varying proportions of silage and barley depending on the size and type of cattle being fed. Total mixed rations are fed which promote maximum feed intake and gain. Premixes and/or supplements are also fed providing a totally balanced ration.

## Other Expenses

Interest is an expense incurred which must be considered on both feed and cattle. The sooner an animal is marketed the less interest paid. Custom feedlots due to their feeding capabilities can usually get cattle to market in less time than an individual feeder.

Yardage is a fee charged by the feedlot to cover the use of the feedlot facilities. It can range from 0¢ - 25¢/hd/day.

Drugs and veterinary expenses are charged out in many different ways. It may be a flat rate, for example 1¢/hd/day or as is more common a standard amount (Example $7.50/hd). Drugs may be marked up at cost plus 10 - 30%.

Death loss is usually assumed by the cattle owner. Total expenses can vary considerably but are common around 60¢ - 65¢/lb of gain.

The advantages of a custom feed lot for the cattle owner are:

- taxable income can be deferred by selling the next year.
- flexibility.
- less fixed investment in facilities.
- if labour, feed supplies or facilities are short the owner has the ability to retain ownership if desired.
- may be more bargaining power when marketing cattle.
- feeding of cattle is more efficient as they are sorted and grouped depending on frame size, and weight.

Factors to consider when visiting a feedlot and questions to ask:

- ask to see close outs of the five worst, five best and five average pens.
- check out the ability of the feedlot to market fat cattle.
- physical appearance of the feedlot.
- what kind of cattle does the feedlot specialize in.
- are they approachable and easy to talk to.

Custom feedlots have developed into an industry due to a need by producers to have flexibility in their marketing decisions. They can not guarantee profit for your cattle but do provide options. Through sound financial management and careful planning and observation there may be more positive close outs than negative.

For further information regarding break even analysis and other points noted in this article contact your nearest Alberta Agriculture office who can put you in touch with a marketing or livestock specialist.

Written by: Dale Zobell

# FEEDLOT BLOAT

Gas is continually produced in the rumen and is easily belched out most of the time. However, when a calf bloats, the gas is being produced faster than being belched out. There are many reasons for the gas not being expelled fast enough. Some of the reasons relate to neural disorders, the esophagus being blocked, respiratory problems, or even lesions in the rumen, but the majority of the reasons for bloat are related to the diet. Abrupt changes in the diet or the feeding of highly digestible feeds such as leafy alfalfa, clover or ground grain in combination with legumes are major reasons for bloat. Unfortunately these causes can be hidden by other factors. The following explains how small particle size and the ratio of barley to roughage in the diet influence the incidence of bloat:

## Small Particle Size

The small particles or fines consist of chloroplasts, soluble proteins, soluble carbohydrates, and other ration ingredients. These fine particles have a large surface area exposed for the bacteria in the rumen to attack and digest. As such, digestion occurs very fast and there is a large volume of gas released in a short period of time. Studies show that fine particles have a 47% greater release of gas within the first hour after feeding than coarse particles. Further, fines from ground grain or leafy alfalfa more readily produce froth in the rumen. It appears that these dispersed fines enhance the production of a bacterial slime which stabilizes the gas bubbles or froth, trapping the gas. Saliva is important for bloat control since it can account for up to 2/3 of the daily volume of fluid passing from the rumen. Unfortunately, a finely ground or pelleted diet results in about 20% of the saliva flow of a long hay diet. There are management practices to control fines in the diet. Some of these practises are:

- cleaning out feedbunks and bale feeders regularly.
- moving round bale feeders and adjusting feeding so that leftover feed is minimal.
- avoid chopping hays, use straw or a portion of straw if chopping.
- coarse grind or roll grains so that the kernal is cracked rather than pulverized. Tempering grain, decreasing mill r.p.m. or increasing screen size may be needed.
- feed cereal silage rather than legume-grass silage or mixed hay.

## 40 to 60% Barley In Diet

The bacteria and protozoa which digest the carbohydrates in hays or silage are different from those that digest the starch in grain. Abrupt changes from roughage to grain based diets can result in digestive disorders. Simply put, it takes time for the rumen bugs to change from digesting hay to grain. The 40 to 60% period occurs when calves are eating 7 to 11 lbs. of barley daily. It is an especially critical time since the rumen environment is neither optimum for digesting hays nor optimum for digesting grain and as such bloat occurs. Bloat can be reduced here by:

- having cattle adjusted to the feedlot before stepping up grain levels.
- increasing grain levels gradually.
- adding straw to the diet to slow down digestion.
- feeding a total mixed ration such as silage and grain together.
- having feedbunk space long enough for all calves to eat at once.
- having plenty of water available. The fact that water controls feed intake is often overlooked. Feed intake goes up and down with water intake.

There are feed additives such as Rumensin, Bovatec, salt, or detergent which can reduce the bloat incidence. These additives work either by slowing digestion as Rumensin or Bovatec does or by breaking down the surface tension of the froth-like salt or detergent does. Rumensin and Bovatec are added to feedlot supplements and fed at 0.5 to 1.0 lb/day. Salt and detergent are short term measures to control bloat. Finding and correcting the cause of the bloat is preferred over the use of feed additives.

Written by: Rob Hand

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# BEEF'N' BACON

Alberta
AGRICULTURE

JUL 14 [illegible]

## JANUARY 1990

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Vol. 5, No. 4

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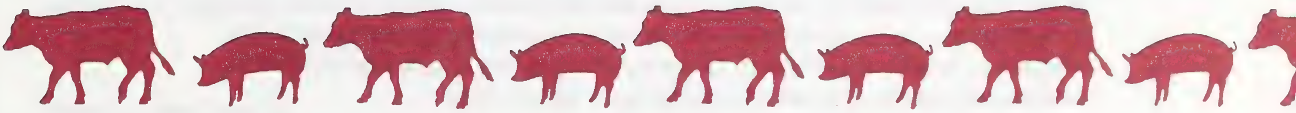

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# RED MEATS

## MEAT CHOICES THAT ARE LOW IN FAT

Health professionals recommend that consumers limit their intake of foods high in fat. A recommendation such as "the diet should contain 30 per cent or less of energy from fat" leaves the average consumer confused. Under Nutrition Labelling guidelines, Consumer and Corporate Affairs Canada is proposing a definition for lean (for meat or poultry) of no more than eight per cent of fat per serving.

Using this guideline, the following cuts of beef and pork would be described as low fat.

| Beef | Pork | Processed Meat |
|---|---|---|
| Round | Leg(ham) | Sliced cooked ham |
| Flank | Loin | Roast beef |
| Ribeye | Shoulder | Pastrami (Montreal smoked meat) |
| Rump | Tenderloin | Grilled back or peameal bacon |
| Sirloin | | "Light" luncheon meats |
| Sirloin tip | | |
| Stewing beef | | |
| Strip loin steak | | |
| Wing steak | | |

Basic rules for wise meat buying as well as wise preparation can lead to lower fat meat choices. These include:

1. Look for well-trimmed cut of meat (1/4" or 3 mm trim or less). Trimming of meat can reduce the fat content by as much as 50 per cent.
2. Look for beef cuts with slight marbling. Marbling is the intramuscular streak of fat seen throughout a cut of beef.
3. Generally, cuts from the hind or hip area of beef and pork contain the least fat, cuts from the middle or loin area contain moderate fat and cuts from the shoulder contain the most fat.
4. Cooking meat so that fat can drip away will keep meat lean. Broil, grill or roast meat on a rack; if microwaving ground meat, put it in a microwave safe colander placed inside a bowl..
5. Cook soups and stews in advance, chill, and remove congealed fat before reheating.
6. Avoid gravy, sauces and breading. Serve meat "au jus," being sure to skim off all fat.
7. Marinate with spices, wine, lemon or tomato juice instead of oil.

Written by: Aileen J. Whitmore

# CALIBRATION PAYS

Electric proportioner mills work by delivering volume not weight. As the bulk density (bushel weight) of your grain, protein source, or premix changes, then your ration changes. Routine mill calibration ensures that the desired weights of each ingredient are being fed. Most electric mills come equipped with shutes and containers to collect the ingredients so that mill calibration is possible. Many feed companies will also offer assistance in calibrating your mill. It's important to understand how to calibrate a mill. If unsure don't be afraid to ask. A mill can be checked and adjusted within 30 minutes. This is little time to invest considering the importance of a properly balanced ration to achieve optimum performance and profit.

If you have used 50 lb barley and now have 45 lb barley, without mill calibrations the following is your potential loss.

Example:

1) The former ration uses 50 lb barley at 11% protein and 0.38% lysine. Table 1 shows the amount of each ingredient to make a 16% protein, 0.78% lysine ration costing $142/tonne.

2) Without calibrating your mill you now start using 45 lb barley at 12% protein and 0.42% lysine.

3) With the new lighter barley the ***volume*** of barley added will be (not calibrated) the same but the ***weight*** will be less. In this case the 820 kg of 50 lb barley is replaced with 738 kg of 45 lb barley. This means the new mix will be 738 kg of barley, 150 kg of soybean and 30 kg of premix for a total of 918 kg. Table 2 shows the amount of each ingredient to make one tonne (1000 kg) of feed. The new ration using light barley will give a 17.23% protein 0.82% lysine ration at a ingredient cost of $145.80/tonne. This ration costs $3.08 /tonne more and protein is being over fed.

4) Table 3 shows the new ration with higher protein light barley (balanced ration)balanced for lysine. This is a 16.5% protein, 0.78% lysine ration costing $140/tonne. This would be a saving of $5.80/tonne compared to the uncalibrated mill using lighter barley.

**Table 1**
Former Mix (balanced ration)

| | | |
|---|---|---|
| Barley | 820 kg | $ 82.00 |
| SBM | 150 kg | $ 45.00 |
| Premix | 30 kg | $ 15.00 |
| TOTAL | 1000 kg | $142.00 |

**Table 2**
New Mix (not calibrated)

| | | |
|---|---|---|
| Barley | 804 kg | $ 80.40 |
| SBM | 163 kg | $ 48.90 |
| Premix | 33 kg | $ 16.50 |
| TOTAL | 1000 kg | $145.80 |

**Table 3**
New Mix (balanced ration)

| | | |
|---|---|---|
| Barley | 830 kg | $ 83.00 |
| SBM | 140 kg | $ 42.00 |
| Premix | 30 kg | $ 15.00 |
| TOTAL | 1000 kg | $140.00 |

For a 100 sow farrow to finish hog operation, a $5.80/tonne feed saving results in saving over $4,000/year in feed ingredient costs.

## CONCLUSION

Calibrate your mill on a regular basis to save you dollars and ensure optimum performance of your hogs. Thirty minutes of your time is all it takes. Beef 'n' Bacon, March 1988, Vol. 3 No. 6 gives details on how to calibrate your mill.

Written by: Bert Dening

# MANIPULATING GROWTH WITH HORMONES

There is currently considerable discussion about the use of growth hormones for pig production. The introduction of such products as porcine somatotropin (PST) will provide a major advance in improving efficiency. However, the importance of these products should not be overrated since they do not provide for miracles and there are several limitations associated with their use. Unfortunately the potential benefits have often been sensationalized and the expectations unrealistic.

## UNDERSTANDING PST

***Porcine somatotropin*** or ***PST*** (also known as growth hormone) is produced and secreted by the pituitary gland at the base of the pig's brain. The amount of secretion of PST is controlled by a stimulatory hormone called ***growth hormone releasing factor (GRF).*** The secretion process is controlled by an inhibiting hormone called ***somatostatin.*** Overall, the extent of PST secretion depends on a balance of stimulating (GRF) and inhibiting (somatostatin) hormones.

Once PST is secreted into the blood circulation it has two distinct effects:

1. Flow of nutrients is directed away from fat synthesis in fat tissue towards productive tissue such as muscle or mammary gland.
2. Somatotropin enhances growth and lactation through a mediator hormone called insulin-like growth factor-1 (IGF-1). Nutrition, management and disease prevention all must be favorable to allow increased IGF-1 secretion from the liver. If not, the benefits will not be seen.

## WHAT ARE THE BENEFITS?

Studies with pigs have shown that under controlled management and environmental conditions optimum injected doses of PST enhanced growth rate by 10 to 35% and improved feed efficiency from 4 to 10%. Carcass composition was also affected with backfat thickness reduced by 33% and loin eye area increased by 12%.

To date several consideration exist:

- Most studies have been carried out using U.S. pigs. Leaner Canadian pigs may not have as great a response to PST.
- Sex of the pig influences response. Greater changes are seen in gilts and barrows compared to boars.
- Response to PST is influenced by diet. PST treated pigs require 20 to 23% protein and 1.2% lysine.
- Treatment of PST increases the incidence of osteochondrosis.
- Treatment of PST is most effective during the finishing phase (50 kg to slaughter).
- Reproduction of gilts is adversely affected. Delays in the onset of puberty are observed.
- Meat quality in treated pigs is similar to untreated pigs.
- PST is safe in food for humans as it is easily destroyed by cooking, and cannot survive the digestive actions of the gut.

## THE PROPOSED APPLICATION

Scientists propose a commercial strategy that will provide cheap growth enhancement from birth to slaughter with the production of a very lean carcass at slaughter. This proposal involves routine vaccination of gilts and sows against somatostatin which would result in higher secretion levels of PST in the blood and enhanced nutrient absorption. At farrowing, piglets would immediately receive growth stimulation via the transfer of antibodies against somatostatin through the colostrum. Evidence suggests sows would have higher milk production and piglets improved cold tolerance. Producers may then achieve further growth enhancement and improved nutrient absorption with a further immunization of pigs at weaning. In the finishing phase (after 50 kg) the most attractive and cost effective strategy is direct treatment of pigs with PST. Improved carcass leaness, feed efficiency and feed costs are the benefits.

The application and transfer of this strategy to the swine industry provides both a challenge and an opportunity. In the future, both producers and consumers will undoubtedly benefit with the use of these products in pig production.

(Based on: New Methods in Growth Manipulation in Swine, B. Laarveld, 1989)

Written by: Marvin Salomons

# HOW TO FINISH CONCRETE FLOORS

Concrete floors are not a natural surface for walking or resting pigs. Pay attention to the texture, temperature and slope of floors, to minimize foot and leg problems.

Floors made too smooth are slippery when wet, causing foot and leg injuries. On the other hand, excessively porous or rough pen surfaces can trap moisture and manure, harboring bacteria. Abrasions to the feet and knees let infections enter the pig's system. Uniformly-sloped floors drain and dry quickly and are easier to clean and disinfect.

When finishing new concrete, use the minimum amount of working that will achieve the desired surface. Excessive trowelling brings too much water to the surface, releases the entrained air and weakens the final cured surface by diluting the cement paste. Different finishing tools give special textures:

- **Imprinted** - The concrete is leveled by screening, then imprinted with a flat tamping tool. This tool is made from expanded steel mesh having 19 x 38 mm (3/4 x 1 1/2 in.) diamond openings. Use for 'super traction' in the sorting and loading area only.
- **Rough wood float finish** - A rough-sawn board brings more grit to the surface. Use this texture where animal traffic requires better traction (breeding pens, group gestation pens, boar pens and alleys).
- **Smooth wood flat finish** - A planed board gives a texture rougher than 'magnesium float', but not as rough as 'rough wood float'. This is the usual finish in growing/finishing and gestation pens, including slotted floors and floor grids.
- **Magnesium float finish** - This tool gives a rippled surface without being gritty. It's a good compromise in farrowing pens to give sows enough traction for getting up and down, yet smooth enough to let the piglets nurse aggressively without damaging their knees and hocks. Use also in gestation and finishing pens.
- **Broom finish** - Dragging a corn broom across the leveled concrete gives a very open, striated texture, suitable for high traffic areas ( breeding pens, around scales but not animal pens). Always broom parallel to the slope, for drainage.
- **Wire brush or wire broom finish** - The wire produces finer striations than the corn broom. This has been used at the rear part of gestation pen stalls to help sows get up and down. The rest of the stall is made smoother (wood float or magnesium float).
- **Steel trowel finish** - This usually follows the first rough leveling or 'screening'. As a final finish, the steel trowel (either hand or powered) makes floors much too smooth and slippery for any animal areas except the dry, heated floor of baby pig creeps. Use it for the dry office and feedroom floors.

**Green concrete syndrome** is a skin irritation presumably caused by the free lime released during the curing and hardening of new concrete. It is seen when young pigs are rushed into new pens before the concrete has fully cured. If possible, wait a full month and thoroughly wash the new floors before the animals occupy the pens. Other treatments are to neutralize with a mild acid solution (such as vinegar) or to seal the concrete with a commerical sealer.

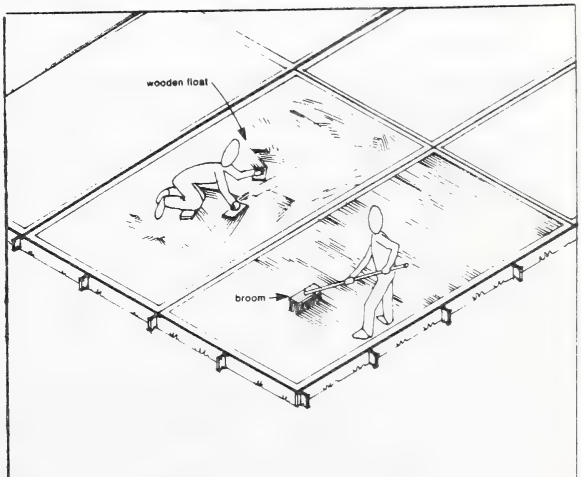


Figure 22 - Broom Finishing

Written by: Robert Borg

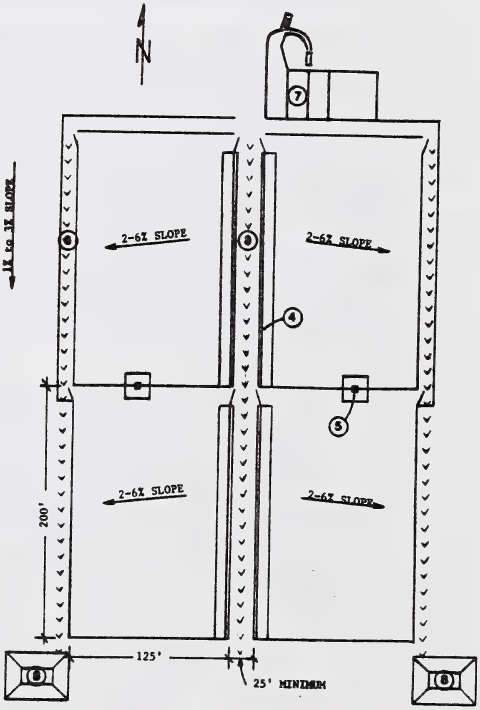
# DESIGNING A SMALL BEEF FEEDLOT

## EXAMPLE: 400 HEAD; (4 PENS OF 100 EACH)

1. Drainage of the site and pens is the single most important factor in good feedlot design. The following recommended slopes should be constructed before any fences etc. are started.
   - o Overall site slope: 1% to 3% to the south.
   - o Pen drainage: 2% to 6% from front to back.
   - o Feed-Alley drainage: small "ditch" in the middle of the feed-alley to allow for good drainage away from in front of the feed-bunks.
   - o Small "ditch" outside of the pen fence to ensure that run-off is removed from the pens to the catch basins (if required).
2.. Pen size based on
   - (a) number and size of animals. 100 feeders require 250 $ft^2$ each
   - (b) limit feeding space required (e.g. 24" per animal) or full feed space required (e.g. 8" per animal)
   - (c) therefore depth of pen is $\frac{\text{total area}}{\text{feed-bunk length}}$

e.g. $\frac{\text{100 animals x 250 ft}^2\text{/animal}}{\text{200' of feed bunk}} = 125'$

3. Feed-alley should be a minimum of 25' wide to ensure good feeding access to each bunk even with a ridge of snow piled in the middle. Feed alley can be used for cattle movement as well.
4. Feed-bunks on 8' wide concrete aprons.
5. Heated waterers located either on the fence-line to service two pens or one waterer per pen if preferred.
6. Cattle alleys 10 or 12 feet wide are optional (instead of using the feed alley).
7. Good set of cattle handling corrals.
8. Catch basins to collect feed-lot runoff.



Written by: Wayne Winchell

# CHANGING REPRODUCTIVE PERFORMANCE IN BEEF COW HERDS

Many producers will be in the midst of calving very soon. Everyone hopes that their previous years breeding and management will culminate in a successful calf crop. As in any business, success or failure largely depends on decisions made by management. This article will deal with priorities essential for good reproductive performance (adopted from article by J.N. Wiltbank, 1985 International Stockman's school).

One of the first priorities should be to reduce the number of nonproducers in your herd. It has been estimated that if you wean 90 calves in a herd of 100 cows the cost per calf is $333 whereas 70 calves weaned increases this cost to $428 (assuming a $250 cost to carry a nonproducing cow).

Additionally weaning weight is another priority that can affect profit substantially. If you assume a $250/cow carrying cost a 500 lb calf at $1.00/lb market price returns $350 net. A 400 lb calf returns $210 even with a higher market value for this calf at $1.15/lb. The cost of keeping a cow whether weaning a 600 lb or 450 lb calf are essentially the same so the benefits are greatly improved on the higher weight calf. Even with a higher market price paid for lighter calves it pays to have higher weaning weights.

Another consideration is that the reason for the lighter weight calf is because it was born later in the calving season (Table 1).

**Table 1 Weaning Weight Influenced by Time of Birth and Average Daily Gain**

| Day of Calving | Average age at weaning (days) | Average daily gain (lb) 2.25 | 2.0 | 1.75 |
|---|---|---|---|---|
| 0-20 | 220 | 565 | 510 | 455 |
| 21-40 | 200 | 520 | 470 | 420 |
| 41-60 | 180 | 475 | 430 | 385 |
| 61-80 | 160 | 430 | 390 | 350 |
| 81-100 | 140 | 385 | 350 | 315 |
| 101-120 | 120 | 340 | 310 | 280 |
| 121-140 | 100 | 295 | 270 | 245 |

Late calves have a great disadvantage as daily gain cannot continue to be high. As grass dries up and the cow's milk supply decreases so does daily gain. In order to have the higher weaning weights calves must be born early and must have the genetic ability and nutrients to grow.

If you look at nonproducers and weaning weights combined you get a total picture (Table 2).

**Table 2 Influence of Nonproducers and weaning weight (100 cow herd)**

| Calves Weaned | Total Animals | Nonproducers | Pounds of calf Weaned per Animal* | | | Net Return/Animal** | | |
|---|---|---|---|---|---|---|---|---|
| | | | 600 | 500 | 400 | 600 | 500 | 400 |
| 90 | 120 | 30 | 450 | 375 | 300 | 200 | 144 | 80 |
| 80 | 120 | 40 | 400 | 333 | 267 | 150 | 100 | 44 |
| 70 | 120 | 50 | 350 | 292 | 233 | 100 | 57 | 6 |

* Average weaning weight/calf

** Market price of $1.00/lb - 600 lb calf, $1.05/lb - 500 lb calf and $1.10/lb - 400 lb calf with $250 cow carrying cost.

The number of nonproducers must be kept low and average weaning weight must be high.

A goal to shoot for is 70-80% of the calves born in the first 20 days of calving with 95% calved within 60 days. Precise management is needed to achieve this and many producers are accomplishing this. If you require further information on this topic or suggestions on how to shorten the calving season and reduce nonproducers contact your nearest Alberta Agriculture office.

Written by: Dale Zobell

# CALVING DIFFICULTY AND OXYGEN STARVED CALVES

The fight for life is not over for a newborn calf after a prolonged difficult birth.

During that struggle, the newborn has likely experienced an oxygen shortage due to the gradual loosening of the placental buttons and the crushing of the umbilical cord in the pelvic canal. That oxygen shortage will change certain blood constituents which will affect the way the newborn reacts to its new environment. For example,the newborn's heat production could be reduced by changes in the blood pH.

These newborns will have a higher body temperature immediately at birth followed by a rapid drop and a delay of up to 24 hours before attaining normal body temperature. The initial high temperature can be related back to a reduced blood flow between the mother and the calf during birth. The subsequent drop in temperature is due to a higher body heat loss and a 10 percent lower heat production. The increased heat loss occurs because the blood flow to the outer body such as the ears, hooves, and tail is not restricted. A normal birth calf will conserve body heat by limiting blood flow to these outer body parts.

Heat production occurs through the breakdown of baby fat, the intake of colostrum and through increased physical activity such as shivering or trying to stand. Unfortunately, these calves - having been oxygen deficient - will be slow to stand and slow to find their mothers milk. Surprisingly, they will not shiver.

Calves experiencing a difficult birth are slow to suckle and will drink less. In the first 12 hours of life, normal birth calves will drink about one litre of colostrum as compared to one quarter of a litre for difficult birth calves. Colostrum is important for heat production and for its immunoglobulins. It is estimated that two litres of colostrum can meet the energy needs of a 90 lb. calf for 24 hours in a 10° C environment.

Calves having a difficult birth will have a higher sickness and death rate than normal birth calves.

Immunoglobulins give passive immunity to infectious disease. They are rapidly absorbed from the digestive tract and can appear in the blood one hour after a meal. It is critical, however, for the calf to get colostrum within the first six to twelve hours of life. Hypothermic calves or calves older than twelve hours have a reduced absorption of these large immunoglobulins. It is common for difficult birth calves to have blood immunoglobulin levels 40 percent of normal birth calves at one day of age. Given these changes that occur after a prolonged difficult birth, it is understandable why these calves have a reduced resistance to cold and infectious diseases like pneumonia or scours. Calves having a difficult birth will have a higher sickness and death rate than normal birth calves. Properly timed calving assistance and additional care of these newborns can improve survivability. A clean, well bedded shed will protect the newborn from the wind and wet ground conditions. Calves that experience calving difficulty should be assisted by a brisk rubbing with a dry towel to help dry and stimulate movement. Placing calves in a hot box or a claiming pen with mother and a heat lamp will be beneficial for cold stressed calves. Watch for signs of colostrum intake and ensure that it occurs by six hours of age.

It can be reduced by remembering that calving difficulty starts at conception. The size of the heifer, the birth weight of the bull, the feeding program through to calving plus many more factors will all influence the ease of calving. Calving difficulty accounts for 28 per cent of the calf death losses in Alberta. That is, an estimated 25,000 calves die every year as a direct result of calving difficulty. (adapted from Vermorel, Can. J. Anim. 69:113)

Written by: Rob Hand

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# BEEF 'N' BACON

Alberta
AGRICULTURE

## FEBRUARY 1990

CANADIANA
MAR 13 1990

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Vol. 5, No. 5

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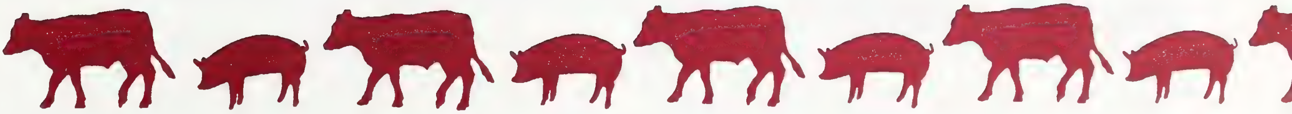

# INTRODUCTION

Beef 'n' Bacon is a winter livestock program for the North Central and North West Regions of Alberta. The newsletter's objective is to reach livestock producers with timely and pertinent topics. Beef 'n' Bacon is distributed to approximately 4,000 livestock producers and agri-businesses in Alberta. It is written and edited from the Red Deer and Barrhead Regional Offices. District Comments (optional) are added by the District Agriculturist.

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# RED MEATS

## SORTING FACTS ABOUT FATS

To many people, fat has become a nasty word, but it is a vital nutrient.

Like carbohydrates and protein, dietary fat is an important source of energy for the body. Fat is the most concentrated source of energy in the diet, providing nine calories per gram compared with four calories per gram from either carbohydrates or protein.

Dietary fat supplies essential fatty acids, such as linoleic acid, which is especially important to children for proper growth. Fat also is required for maintenance of healthy skin, regulation of cholesterol and production of hormone-like substances that regulate some body processes.

Dietary fat is needed to carry the fat soluble vitamins A, D, E and K, and aids in their absorption from the intestine. Fat also helps the body use carbohydrate and protein more efficiently.

The problem is an excess of fat in the diet because this excess is recognized as one risk factor influencing the development of chronic disease.

The main concern about excess animal fat in the diet centers on its potential contribution in raising blood cholesterol. High blood cholesterol is a risk factor in the development of coronary heart disease.

In the past, concern about animal fat has often focused on red meats.

In the past decade, the average portion sizes of red meats have decreased. As well, the fat and cholesterol content of Canadian beef and pork have been reduced. This reduction is a result of improvements in production practices and grading systems that reward leaness rather than fat.

**Written by: Aileen J. Whitmore**

# DOES WEIGHING PAY?

Weighing pigs before marketing takes little time and is a quick way of getting extra dollars out of each hog.

Table 1 shows our current hog grading system and how the index for your hogs is determined. How can a scale pay for itself?

**Table 1: The Canadian Hog Carcass Grading/Settlement System**

| Weight Class | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carcass Weight Range | | 40 - 59.99 kg | 60 - 64.99 kg | 65 - 69.99 kg | 70 - 74.99 kg | 75 - 79.99 kg | 80 - 84.99 kg | 85 - 89.99 kg | 90 - 94.99 kg | 95 - 99.99 kg | 100 + |
| Yield Class | Estimated Lean Yield (%) | | | | | | | | | | |
| 1 | 53.60 | 80 | 100 | 106 | 112 | 114 | 113 | 111 | 108 | 100 | 81 |
| 2 | 52.8 - 53.59 | 80 | 98 | 105 | 111 | 113 | 112 | 109 | 107 | 98 | 81 |
| 3 | 52.0 - 52.79 | 80 | 97 | 103 | 109 | 112 | 111 | 108 | 105 | 97 | 81 |
| 4 | 51.2 - 51.99 | 80 | 95 | 101 | 107 | 110 | 109 | 107 | 103 | 95 | 81 |
| 5 | 50.4 - 51.19 | 80 | 93 | 100 | 106 | 108 | 107 | 106 | 102 | 92 | 81 |
| 6 | 49.6 - 50.39 | 80 | 92 | 98 | 104 | 107 | 106 | 104 | 100 | 90 | 81 |
| 7 | 48.8 - 49.59 | 80 | 90 | 96 | 102 | 105 | 104 | 102 | 97 | 87 | 81 |
| 8 | 48.0 - 48.79 | 80 | 89 | 95 | 101 | 103 | 102 | 101 | 95 | 83 | 81 |
| 9 | 47.2 - 47.99 | 80 | 88 | 93 | 99 | 102 | 101 | 99 | 92 | 82 | 81 |
| 10 | 46.4 - 47.19 | 80 | 87 | 91 | 97 | 100 | 99 | 97 | 90 | 82 | 81 |
| 11 | 45.6 - 46.39 | 80 | 86 | 89 | 96 | 98 | 97 | 96 | 88 | 82 | 81 |
| 12 | 44.8 - 45.59 | 80 | 85 | 88 | 94 | 97 | 96 | 94 | 85 | 82 | 81 |
| 13 | 44.0 - 44.79 | 80 | 83 | 87 | 92 | 95 | 94 | 92 | 82 | 82 | 81 |
| 14 | 43.2 - 43.99 | 80 | 82 | 86 | 90 | 91 | 90 | 91 | 82 | 82 | 81 |
| 15 | 42.4 - 43.19 | 80 | 82 | 85 | 88 | 89 | 88 | 87 | 82 | 82 | 81 |
| 16 | 41.6 - 42.39 | 80 | 82 | 82 | 87 | 88 | 87 | 86 | 82 | 82 | 81 |
| 17 | 41.60 | 80 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 81 |

**Example:**
Assume we have two identical hogs, one is shipped at 87 kg. (191 lbs.) the other is kept until 97 kg. (214 lbs.) but loses one yield class.

Assumptions:

1) $ 1.30/kg market price

2) both hogs are identical (ie: each have the same potential)

3) the light hog indexes 98 (yield class 6, dressed weight 68 kg.)

4) the target hog indexes 105 (yield class 7, dressed weight 76 kg.)

| Light Hog | Target Hog | |
|---|---|---|
| Live Weight | 87 kg. (191 lbs.) | 97 kg. (214 lbs.) |
| Dressed Weight | 68 kg. (150 lbs.) | 76 kg. (167 lbs.) |
| Price per kg. dressed | $1.27 ($1.30 x .98) | $1.37 (1.30 x 1.05) |
| Return per hog | $86.40 ($1.27 x 68 kg.) | $104.00 ($1.37 x 76kg.) |

**Written by: Bert Dening**

In this case, the increase in live weight from 87 to 97 kg. returned an extra $17.60/hog.

At a 4:1 feed conversion, the extra feed needed to put on 10 kg. live weight is 40 kg.

Assuming feed at $150.00/tonne or $0.15/kg., the cost of this feed is $6.00/hog.

The extra return above feed costs is $17.60 - $6.00 (feed) or $11.60/hog.

If we take a 100 sow operation selling 1800 hogs a year and 1/3 or 600 hogs were shipped light then the cost of marketing light hogs would be 600 x $11.60/hog or $6,960.00. A potential gain of $6,960.00 will pay for a lot of weigh scales.

I realize it is impractical to ship hogs every day but a scale will allow you to keep border line hogs back for a better grade and return the following week.

A weigh scale can have many uses on a hog farm. You can use it to determine costs of certain rations, when to switch rations, growth rates, etc. A weigh scale is a small investment that has the potential for great gain.

# COPING WITH TEMPERATURE CHANGES

Domestication of pigs has challenged us to provide optimal housing, feeding and care while maintaining efficient production. The present breeds used in today's operations are vulnerable to environmental influences. Pigs kept both in and outdoors place high demands on their climatic conditions with temperature being of prime importance.

## DEFINING IDEAL TEMPERATURE

Pigs are homeothermic (warm-blooded) animals regulating body temperature through a process called thermoregulation. Heat is produced by biochemical reactions in the body. Combustion of energy for an animal's activity and digestion of feed are metabolic processes that generate heat.

The range in which body temperature and heat production can be kept constant is called the ***thermoneutral zone.*** Outside of this zone pigs will compensate by adjusting the thermoregulatory process to either increase or decrease body heat production. At some point in a cold environment, the minimum heat production of the pig will no longer match the demands of the surrounding environment and the pig will have to increase its metabolic rate to maintain body temperature. This point is referred to as the ***lower critical temperature (LCT).*** The LCT can be influenced by other factors such as exposure to drafts, provision of beding, or the ability of the pig to huddle with other pigs (Table 1).

**Table 1: Temperature Requirements of Piglets**

| | |
|---|---|
| Deep body temperature | 39 °C |
| LCT (individual) | 34 °C |
| LCT (huddled) | 25 °C |

## HOW DO PIGS COPE?

Pigs do have the ability to cope with the environment in which they are placed. The adaptations which take place are observable behavioral changes as well as physiological and hormonal changes.

### 1. Behavioral Changes

Pigs give overt clues as to how they are fitting their environment. Behavorial patterns that are often observed are:

- Pigs housed outdoors will orient their body position relative to the sun or wind.
- Pigs housed indoors will lie in a different position on a cold floor as opposed to a warm floor. Body surface contact with a 15 °C concrete floor is minimized by lying on the sternum with the legs curled under. On a 35 °C plastic flooring pigs lie flat exposing a larger portion of the body surface for heat discipation.
- Pigs housed in groups will huddle to minimize heat loss.
- In high temperatures pigs avoid each other and seek contact with cool surfaces that absorb heat.
- Pigs reduce the surface of their body exposed to a draft by lying in the direction of the airflow.

### 2. Physiological Changes

The pig's body will react to maintain equilibrium with its environment:

- Pigs shiver to produce heat near the skin surface.
- Pigs raise their hair to increase air holding capacity and insulating value.
- Blood vessels in the outer tissues are narrowed to reduce heat loss. In young pigs this can increase tissue insulation by 18% if the temperature drops by 10 °C.
- During long periods of cold exposure pigs increase feed intake resulting in increases in fuel for heat production.
- Prolonged cold exposure can increase hair growth and backfat thickness as well as influence pig shape (smaller body surface and shorter legs).

### 3. Hormonal Changes

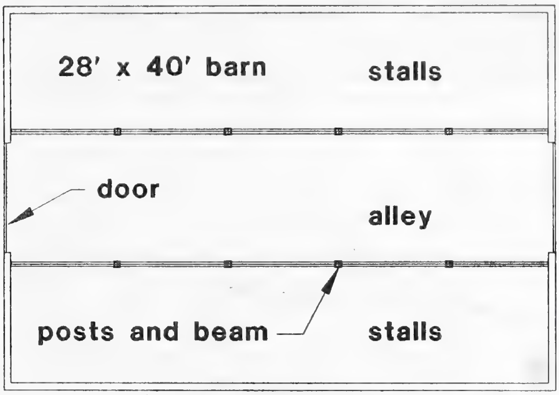
Hormones acting as the body's messengers also cause changes:

- Under cold exposure increased levels of blood hormones (such as thyroxine, and catecholamines) makes extra energy available for heat production.

Pigs are able to adapt to temperature changes, yet, if conditions in the pig's environment are not kept optimal, disease organisms which infect the pig can multiply. Changes in thermoregulatory and hormonal functions may be enough to cause a disturbance in the body's equilibrium to result in a disease outbreak.

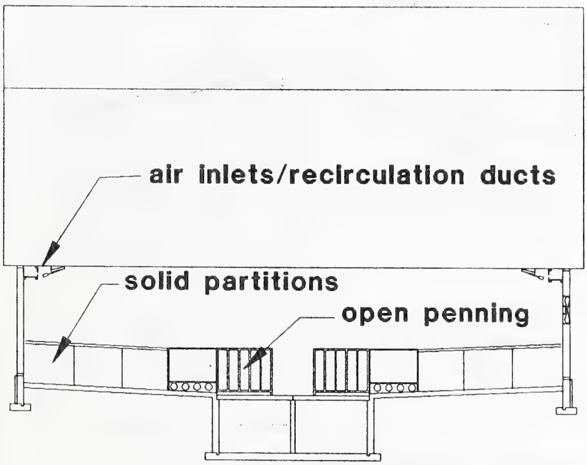
**Written by: Marvin Salomons**

# HOW TO CONVERT AN OLD HIP-ROOF BARN TO A FINISHER BARN


28' x 40' barn
stalls
door
alley
posts and beam
stalls

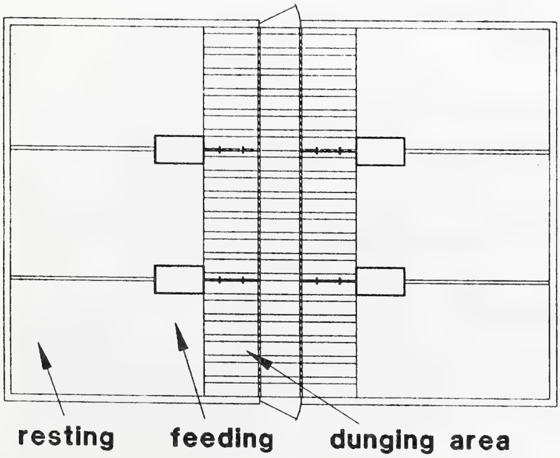
## Layout

Standard finisher pens range in size from 6 - 10 ft. wide and 16 - 18 ft. long. The conventional way to arrange pens in an old barn is to make the alley parallel to the existing alley. This results in very short pens in a two row layout or very long pens in a one row layout. If you turn the arrangement 90 ° and have the alley cross-wise to the barn, you can end up with a conventional pen layout.


air inlets/recirculation ducts
solid partitions
open penning

## Ventilation Advantage

The post and beam system supporting the hay loft in old barns interferes with good air movement. This new arrangement allows air to move in the same direction as the beams, eliminating obstructions to air flow.


resting
feeding
dunging area

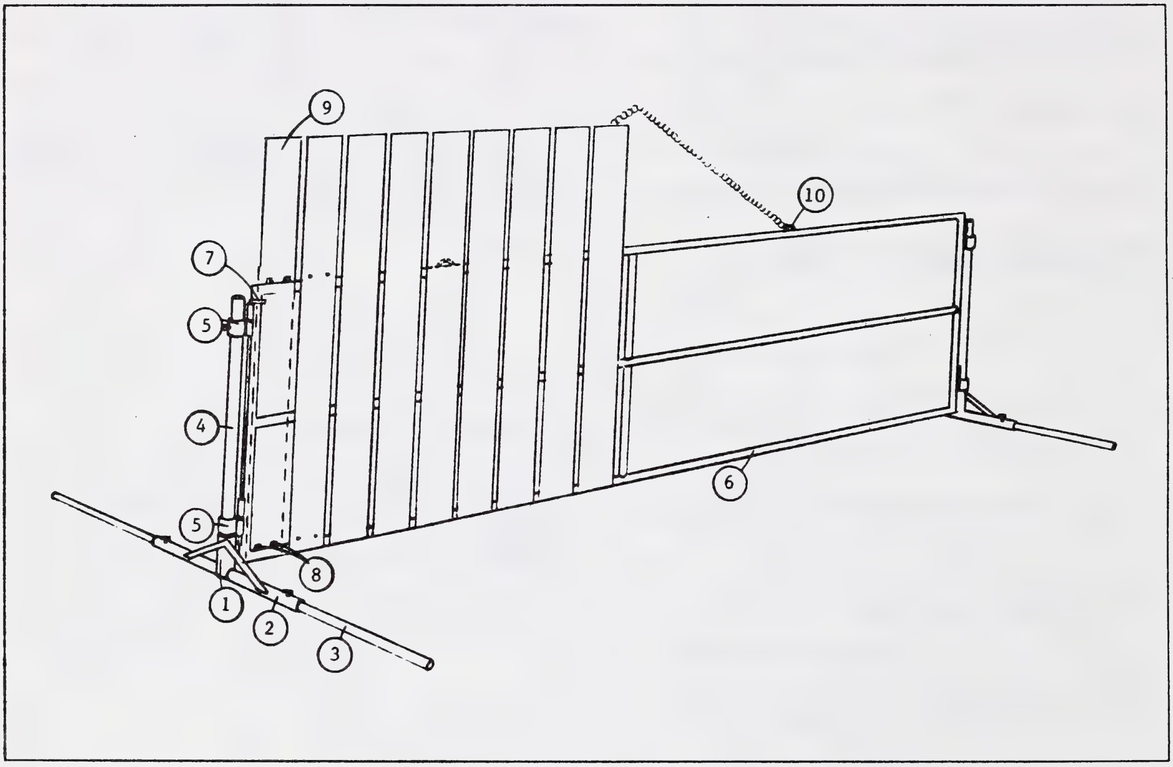
## No More Sleeping in the Kitchen

High activity areas are located in the center of the barn. This is the dunging and feeding area. The back area of each pen is a quiet resting area. The self feeders can be on the slats or on the solid floor. Pigs can eat, get a drink, use the dunging area - -all without disturbing pigs resting at either end of the barn! Solid pen partitions at the back reduce drafts in the resting area. Open penning at the front allows socializing.

**Written by: Robert Borg**

# PORTABLE WINDBREAK FENCING

This 20' long pipe frame, portable windbreak fence can be moved with a front end loader to provide shelter at a new winter feeding area or to provide shelter in a calving pasture. A series of these panels can be arranged in various patterns to accommodate any sized herd.



1. 2 7/8" diameter x 12" long drill stem sleeve with 4" x 4" x 1/4" plate welded on ground end.
2. 2 3/8" x 24" drill stem welded on both sides of sleeve; with angle iron braces.
3. 1 7/8" extension pipes for stability; wing screws in ② to secure.
4. 2 3/8" x 6' 6" drill stem "post" inserted into sleeve.
5. 2 7/8" x 4" collars with 3/4" x 4" pipe hinge; wing screw in top collar to secure.
6. 2 3/8" pipe frame; 6'6" high; 20' long with 3/4" x 4" pipe hinges both ends.
7. 5/8" steel "pin" 6' long..
8. 1 1/2" angle iron brackets welded to pipe; drilled for 5/16" bolts to secure planks.
9, 1" x 10" planks, bolted to frame.
10. Lifting bracket welded to frame for chain lift with front end loader.

**Source: N. Kennett, Barrhead**

**Written by: Wayne Winchell**

# VITAMIN E FOR BEEF CATTLE

As most producers are aware it is important to feed balanced rations to beef cattle with optional levels of the various nutrients. Nutrition research is continually updating the nutrient requirements and information which in turn is passed on to the producer by nutritionists and others. Recent advances in Vitamin E research is an example of this.

In the early 80's a new method of determining Vitamin E levels of feeds was developed - called High Performance Liquid Chromotographic Fluorescence (HPLC). This has enabled private and government labs to more closely analyze feeds for Vitamin E content and this has also shown the need for additional supplementation as feeds that were once considered adequate for Vitamin E now appears to be deficient.

Vitamin E has important functions in basic metabolism processes and a deficiency may not be readily recognized. Major diseases associated with a deficiency in beef cattle are muscle degenerations, infertility, retained placenta and mastitis. The main function of vitamin E is metabolic in nature and has a close relationship with selenium. Both of these two nutrients must be in adequate supply for the other to function properly.

As with any nutrient there are a number of factors that can affect the availability and content in a feed and vitamin E is no exception. Factors that affect levels are:

- harvest time,
- drying and prolonged harvest,
- ensiling,
- conservation with propionic acid,
- feed processing (grinding, pelleting, heat treatment).

In view of these factors and even though we have the ability to accurately test for vitamin E activity, animal nutritionists have concluded that the natural vitamin E content should not be included in the feed ration composition. It constitutes a reserve, but the actual requirement of the animal should be covered by a supplement of some sort.

If this is the case then what is the requirement? Well, it appears no one agrees on this and it is difficult to find good practical advice. Information reported by Hoffmann - La Roche Ltd. (Etobicok1e, Ontario) a manufacturer of vitamin E, show the following levels in feeds and requirements of beef cattle:

| **Feedstuff** | **Region** | **Range** | **Ave. IU/Kg** | **Reliable * Level IU /Kg** |
|---|---|---|---|---|
| Grass Hay | Alberta | 0-26 | 13 | 7 |
| Legume Hay | Alberta | 10-48 | 22 | 10 |
| Barley | Alberta | 6-13 | 9 | 7 |
| High Moist. Barley | Alberta | 0-8 | 5 | 2 |

* Reliable level = Average minus one standard deviation

Beef cattle requirements (IU/day):

Steers - 300 (350 kg at 1.5 kg ADG

Heifers - 270 (based on steers minus 10%)

Cows - 320 (450 Kg dry cow)

If you go by these requirements most diets in Alberta are deficient in vitamin E - - even with supplementation as most supplements contain small amounts of vitamin E.

In a feedlot trial in Texas (September, 1986 Feedstuffs, page 12) researchers concluded the optimum level for steers was 100 IU/day although they did get a response at 300 IU. Vitamin E is quite expensive. If additional levels are required this will increase the cost of a supplement on an animal per day basis. However, the cost will be minimal.

The National Research Council publication, Nutrient Requirements of Beef Cattle (1984) fails to provide a vitamin E requirement but suggest normal diets are apparently adequate for adult cattle. This is a marked contrast to Roche's figures.

So what to do. Talk to your local veterinarian, feed outlet or Alberta Agriculture livestock specialist and determine what levels are in the supplements, vitamin injections or feed mixes you use. By asking about it a greater awareness will be created and those involved will be

**Written by: Dale ZoBell**

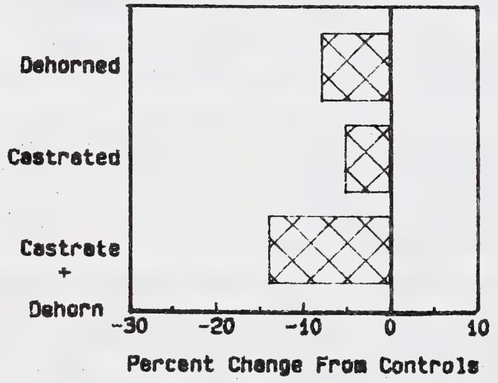
# Dehorn And Castrate Calves Early ?

Marketing is more than offering your product for sale. It involves packaging to show off the product's desirable features. For cow calf producers, their market is the feedlot. The feedlot may pay a $2.00 to $3.00 premium for high performance calves but will also discount calves if given a chance. Calves can be discounted for sickness, runny eyes, limited growth potential, having horns, being bulls and for other reasons. Some discounts are justifiable and others perhaps questionable. For example, are discounts for horned or bull calves justifiable?

The North West Cattle Feeders, a group of feedlot operators in north west Alberta conducted four trials in three feedlots from Niton Junction to Athabasca. They were interested in the overall cost to dehorn or castrate a calf. Once adjusted to the lot, calves were weighed and either dehorned, castrated if not previously done, or both dehorned and castrated. A group of previously dehorned steers were used as the controls. Animals were weighed initially and at 14 and 80 to 100 days after treatment.

During the first 14 days after being dehorned or castrated gains were extremely depressed. The most stressed calves were those that had been both dehorned and castrated. They experienced a 66% depression in gain from the controlled calves. The dehorned animals and the castrated animals had a 31% and 42% respectively, drop in gain during this time.

Percent Decrease in Gain From Control Calves
0 - 92 Day Period



**Written by: Rob Hand**

Animals were slow to recover from the treatment. From 14 to 92 days after treatment, gains for the dehorned animals and animals that were both dehorned and castrated was 5% lower than the castrated and control animals. This indicates that animals recover faster from being castrated than dehorned.

By 92 days after treatment, the stress of dehorning and castrating was still evident as shown in the graph (shown on the left).

Again, animals that were both dehorned and castrated had the largest depression in gain. Interestingly, the 8% decrease in gain from dehorning plus the 5% decrease in gain from castrating is very near the combined 14% decrease from animals that were both dehorned and castrated. Obviously, these procedures are stressful.

But performance is not the only issue. Dehorning and castration are costly for the feedlot. There is an increased risk of death, increased time and labor at processing, and increased handling to check individual calves after the operation.

These trials indicate that horned bull calves weighing from 600 to 800 pounds can justifiably be discounted up to $5.00 per cwt. Calves with either horns or testicles can be discounted up to $2.00 to $3.00 per cwt. The actual discount applied will of course be dependent upon other factors than performance such as availability of feeders, the length of time the feeders will be in the feedlot and whether the feedlot operator actually dehorns or castrates incoming feeders.

## When Should Dehorning And Castration Be Done

Dehorning is best done when the calves are a few days old when the procedure is painless and recovery is quick. A caustic stick is very effective up to one week of age, provided the horn button is scratched before the caustic is applied. Apply vaseline around the base of the horn to prevent the acid from running and do not apply more than required. Electric dehorners are also an acceptable method of dehorning providing the calf is young. The heat will quickly sever any nerves present so that it, too, is relatively painless.

Similiarly, castration should be done prior to weaning preferably before the calves are 60 days old. The one exception is to delay castration to weaning in areas where calves are susceptible to water belly. Surgical removal of the testicles is preferred but elastic rings or crushing the cords with a Burdizzo are also acceptable providing the calf is young. Contact your veterinarian for the proper use of these methods.

CANADIANA

# BEEF 'N' BACON

Alberta
AGRICULTURE

## MARCH 1990

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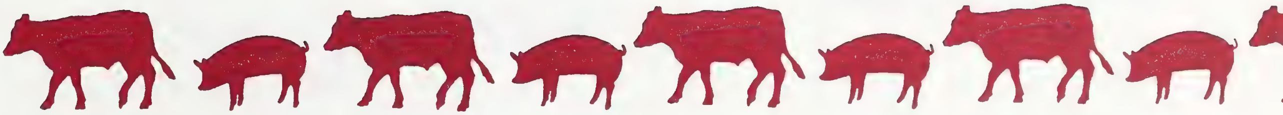

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# RED MEATS

## CHOLESTEROL STIRS DIET DEBATE

It's a modern dilemma. We really don't have all the pieces to the puzzle, but rather than wait years for a definite word, we use the facts available to formulate guidelines that may prove helpful.

Most recently, health and medical aurthorities have focused on high blood cholesterol as a risk factor in heart disease and on changing diet to improve our chances of longevity. Cholesterol has become the focus of conversation from carpools to local coffee shops.

Experts are embroiled in a highly visible argument over whether blood cholesterol levels should be lowered in all people.

As the debate continues, it's essential that sound science provide the guiding light for consumers.

Blood cholesterol is just one risk factor in the development of heart disease and should be viewed in context with other important factors such as obesity and exercise. The factors of age, sex and heredity are significant but uncontrollable. The recognized fact that high blood pressure and smoking are significant and controllable risks has lost emphasis in the wave of publicity on cholesterol. Any well-balanced approach to the prevention of heart disease must emphasize all of these factors.

Today experts believe that saturated or hard fats are more important than dietary cholesterol.

The practical answer for most consumers may be quite simple. Dietary extremes don't make sense. The wise approach is middle-of-the-road to ensure that we're getting a balance of nutrients, from a variety of foods, in moderate portions - the foundation of a healthful diet.

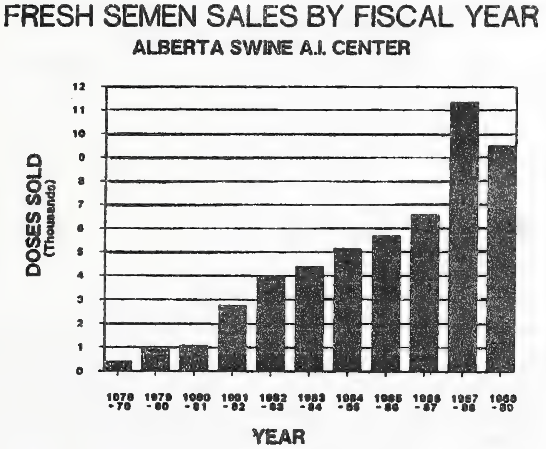
**Written by: Aileen J. Whitmore**

# SWINE ARTIFICIAL INSEMINATION

Swine Artificial Insemination is an effective and low cost method of introducing new genetics without affecting your operations health.

## HISTORY

The Alberta Swine Breeding Centre is one of the largest and most successful Swine AI centres in Canada. The Alberta Centre was started in 1978 and has experienced steady growth up to the present.



Located a few miles east of the Edmonton International Airport, the AI Centre ships fresh boar semen all over Canada. Fresh semen in Alberta is distributed via bus lines and most places in Alberta can receive semen the same day it is collected.

The Swine Breeding Centre has boars from five major breeds with a barn of 40 boars. Semen is collected every Monday and Thursday morning and shipped out the same day.

Swine AI is easy to do and something all hog producers should consider.

## ADVANTAGES OF AI

- AI gives you the best genetics without spending big dollars.
- AI gives you access to a variety of breeds and different lines to reduce inbreeding.
- Your top sows can be bred to top boars producing replacement gilts with excellent genetics.
- AI reduces the risk of introducing new disease.
- A closed herd can be maintained and new genetics still brought in.

## SUPPLEMENTARY AI

AI can easily be used to supplement a natural breeding program. For example, a boar can be used for the first mating (morning) and AI can be used for the second mating (afternoon or next morning). Research has shown that using two different boars on the same sow increases litter size. AI can do the same results with less boar power.

## HOW TO GET STARTED

Contact your Regional Swine Specialist, District Agriculturist or the Swine Breeding Centre at 986-1250. If there is enough interest, an AI course can be set up in your area.

Your Regional Swine Specialist is willing to demonstrate AI on your farm and AI Centre will provide doses of ***free*** semen for first time users. If you are interested in trying AI ***free of charge*** on two sows, contact your Regional Swine Specialist.

## CONCLUSION

Many economically important traits (backfat, growth rate) are easily improved through good genetics. AI is the most cost efficient way of introducing these genetics.

**Written by: Bert Dening**

# WHAT CAN YOU BELIEVE?

All of us are constantly bombarded with information on new products, ideas or management practices. In the present world where information is doubling every five years it becomes exceedingly difficult to keep up let alone sort out the good from the bad. On one hand, to progress we all have to be receptive to new ideas and be willing to make changes in our thinking and our management approaches. However, if we believe everything we are told or buy every new product that is offered to us we will quickly go broke.

## DETERMINING REAL DIFFERENCES

We all have information presented to us at technical meetings or by industry representatives promoting their products. In most cases information is presented comparing the performance of product **X** with product **Y**. It is important in these cases to know if the product or treatment differences are real or are due solely to chance.

As an example let's look at a set of data. As shown by **TABLE 1,** product **X** was fed to six pigs or six pens of pigs and an equal number were not fed product **X.** The average growth rate was 1.2 and 1.4 lb/day for the untreated and treated pigs respectively. This difference was statistically significant. In other words there is a high probability that the difference is due to the product and not due to chance.

TABLE 1. THE EFFECTS OF PRODUCT X ON PIG GROWTH

| | GROWTH RATE/DAY (LB) | |
|---|---|---|
| PIG | CONTROL | TREATED |
| 1 | 1.2 | 1.4 |
| 2 | 1.2 | 1.3 |
| 3 | 1.3 | 1.4 |
| 4 | 1.3 | 1.4 |
| 5 | 1.1 | 1.5 |
| 6 | 1.2 | 1.2 |
| Average | 1.2 | 1.4 |

This difference **IS** significant.

In a second experiment shown in **TABLE 2** similar pigs also had average growth rates of 1.2 and 1.4 lb/day. This difference was not significant. In this case there was a larger variation in growth rates within each treatment. The average performance for each treatment did not adequately represent the population of the pigs tested. Averages are not always what they seem to be.

Adapted from: Information you Can Trust
- FX Aherne, 1990.

**Written by: Marvin Salomons**

TABLE 2. THE EFFECTS OF PRODUCT X ON PIG GROWTH

| | GROWTH RATE/DAY (LB) | |
|---|---|---|
| PIG | CONTROL | TREATED |
| 1 | 1.8 | 2.0 |
| 2 | 2.0 | 0.8 |
| 3 | 0.6 | 1.8 |
| 4 | 0.4 | 1.0 |
| 5 | 1.6 | 1.9 |
| 6 | 0.8 | 0.9 |
| Average | 1.2 | 1.4 |

This difference is **NOT** significant.

## WHAT DOES SIGNIFICANCE MEAN?

Significance is just a statement of probability. In simplistic terms it indicates to us the chances of the event repeating itself. Significant levels are usually expressed as a percentage, for example, significance at the 5% level. This means there is a 95% certainty that the difference is not due to chance. In other words given the same conditions 95 times out of 100 we would expect to see this difference. Significant at the 5% level is written as $P<0.05$. Significance at the 1% level is written as $P<0.01$. For most purposes we do not like to accept probability levels worse than 5%.

## WHAT ABOUT VARIATION?

Averages or means are not the only information you need to know. You must know the confidence of the estimate by analyzing the variation. A measure of the variation about the mean or average is referred to as the ***standard error*** **(SE)** or ***standard error of a mean*** **(SEM)**. If the SE given is high there is a lot of variation about the mean and the differences between the means have to be greater for significant differences to occur. The opposite is true if the SE is low. A good rule of thumb to follow is if the differences between any two means is greater than three times the pooled SE or SEM then that difference is significant.

Remember to check for the amount of variation. Poor experimental design with small numbers of pigs, sows or pens used can also cause large differences that are not significantly different.

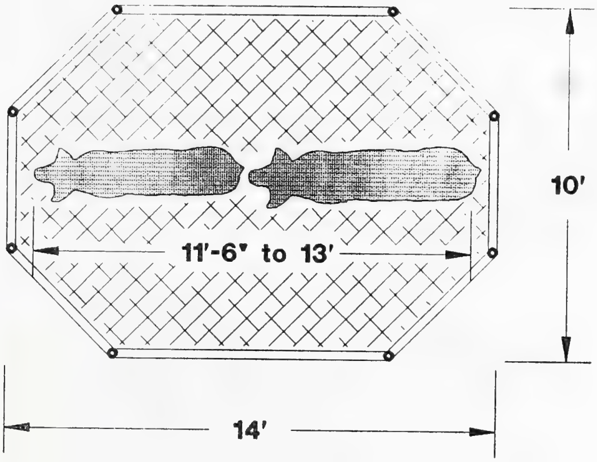
# HOW TO BUILD AN OCTAGONAL BREEDING PEN

Small pens inhibit mating because of insufficient space. As the boar follows the sow around the pen prior to mating he needs room to walk forward without pivoting on his hind legs or arching his back. Also as the boar approaches the rear quarter of the sow prior to mounting the pen should be at least as long as the sum of the boar and sow nose to tail lengths.

## OCTAGONAL PEN

A boar has difficulty gaining access to a gilt in pen corners. The octagonal shape will improve mating performance.

The floor should be a non-slip design. A special breeding pen will not have obstructions such as drinkers and feeders to obstruct or unbalance the pigs.



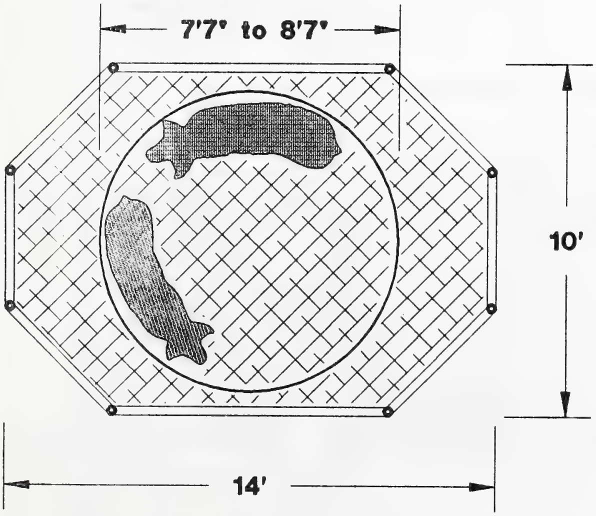
### PEN LENGTH

Some breeding pens are only long enough on the diagonal. This design is based on the pig's length. Pen length required is the sum of the nose to tail length of the sow plus boar.

| SOW | LENGTH |
|---|---|
| 238 kg | 1.92 m (95th percentile) |
| 183 kg | 1.77 m |

| BOAR | LENGTH |
|---|---|
| 12 months | 1.73 m |
| 33 months | 2.0 m (mature boar) |

The required pen length is then between 3.5 m and 3.92 m or 11' 6" to 13'.



### UNINHIBITED TURNING CIRCLE

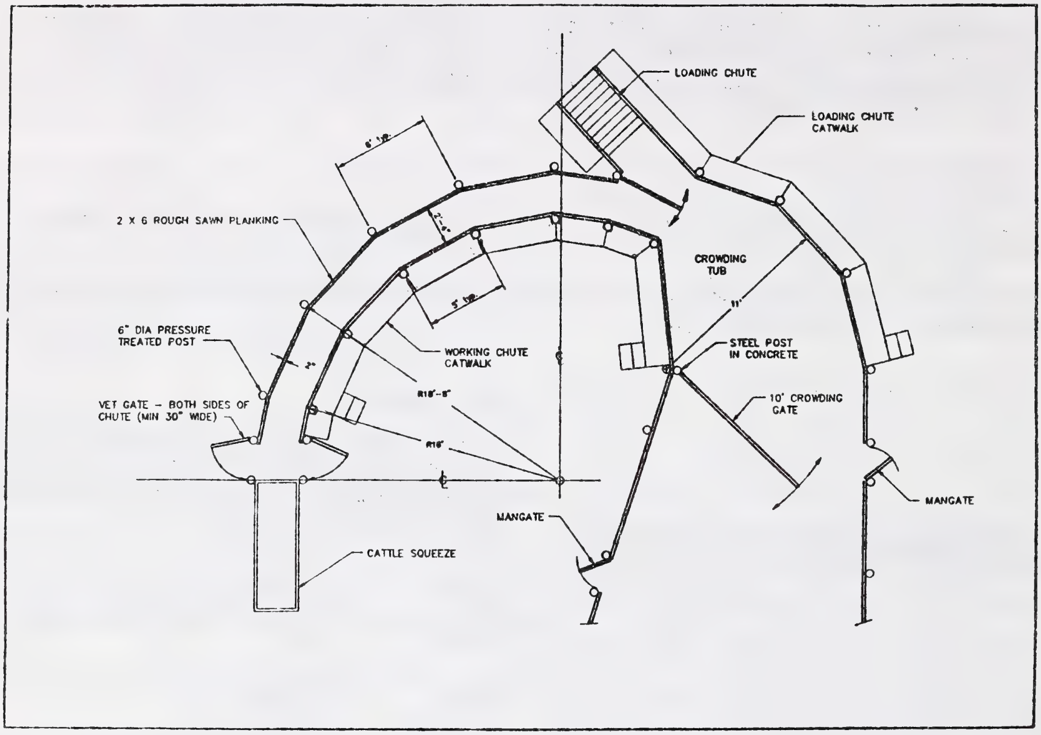
Pigs require a turning circle diameter = 1.67 x tail to shoulder length + width at shoulder.

| BOARS | TURNING CIRCLE |
|---|---|
| 12 months | 2.3 m |
| 33 months | 2.6 m |

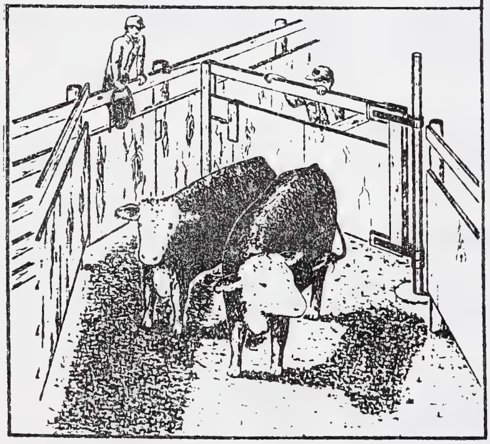
This is 7'7" to 8'7" diameter to turn in without difficulty.

**Written by: Robert Borg**

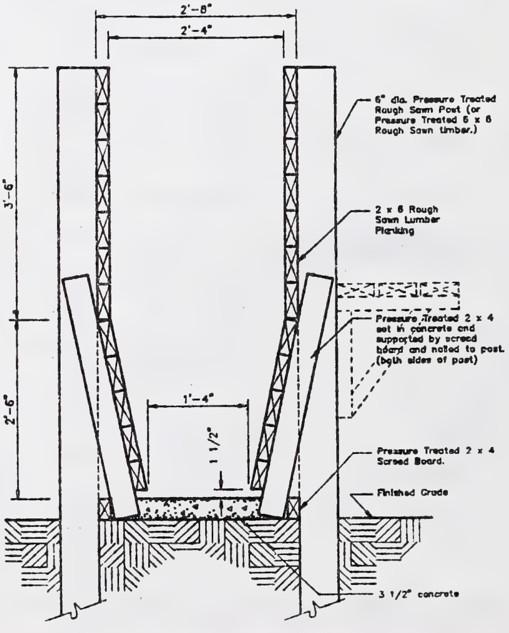
# TYPICAL WOODEN WORKING CHUTE AND CROWD TUB


LOADING CHUTE
LOADING CHUTE CATWALK
6' typ.
2'-6"
5' typ.
2 X 6 ROUGH SAWN PLANKING
CROWDING TUB
11'
6" DIA PRESSURE TREATED POST
WORKING CHUTE CATWALK
STEEL POST IN CONCRETE
2"
R18'-8"
10' CROWDING GATE
VET GATE – BOTH SIDES OF CHUTE (MIN 30" WIDE)
R16'
MANGATE
MANGATE
CATTLE SQUEEZE

**CROWDING GATE**



NOTE: SEPARATE STEEL POST FOR CROWD GATE


2'-8"
2'-4"
3'-6"
2'-6"
1'-4"
1 1/2"
6" dia. Pressure Treated Rough Sawn Post (or Pressure Treated 6 x 6 Rough Sawn timber.)
2 x 6 Rough Sawn Lumber Planking
Pressure Treated 2 x 4 set in concrete and supported by screed board and nailed to post. (both sides of post)
Pressure Treated 2 x 4 Screed Board.
Finished Grade
3 1/2" concrete

WORKING CHUTE – SLOPING SIDES w/Plank Siding
Scale: 1" = 1'– 0

**Written by: Wayne Winchell**

# BUILD VS BUY THE SINGLE FILE WORKING ALLEY AND CROWD TUB

The most time consuming section to build is the single file alley and crowd tub. It is also the center piece of any corral system so extra effort here can be rewarded by easier cattle movement. Fifty man hours of labor could be spent building this section from wood and perhaps another 60 to 70 man hours to build the remaining sections of the handling facility. In contrast, manufactured alley and tub will take about 10 man hours to set up on any farm.

The new designs for the single file working alley and crowd tub (facing page) allows for easier movement and control of cattle. In many ways, facilities built from wood are better than commercially manufactured equipment since the sides can be made solid and the system works quieter.

The material costs (posts, labor, hardware and cement) for a 25 foot single file alley and 10 foot diameter crowd tub will be about $850.00 plus about $400.00 for labor. The equivalent commercial set up will cost in excess of $3700.00 excluding any cement work. Thus, the difference is at least $2850.00 ($3700.00 - $850.00). If an extra 40 hours of labor is required to build the structure rather than purchase it, then one is saving $2850.00 - $400.00 = $2450.00 by building it yourself.

Cattlemen wanting portability in their handling system should not discount farm built facilities. Based on the above costs, one could possibly build three single file alleys and crowd tubs - one at home, and one at each of two pastures for the equivalent cost of one manufactured unit.

Here are some advantages and disadvantages associated with each system:

## FARM BUILT OF WOOD OR METAL

### Advantages

- Relatively inexpensive to build.
- Up to 30 years of life if well built with pressure treated posts and wood stained.
- Build as desired.
- Quieter than metal.
- Cattle move well.
- Depending on design, can accommodate calves & cows in same alley.
- Catwalk easily added.

### Disadvantages

- Must start with a well designed plan.
- Labor to build.
- Some maintenance.
- Small calves may turn in alley, depending on design.

## PURCHASE COMMERCIAL SET-UP

### Advantages

- Easily set-up in a short period of time.
- Up to 30 years of life if a quality product purchased.
- Portable.
- Sides easily adjustable to accommodate all cattle sizes.
- Resaleable.

### Disadvantages

- High purchase cost.
- Some maintenance.
- Can be noisy.
- Sides of alley not usually totally enclosed such that cattle are more likely to balk.
- Catwalk difficult to add.

**Written by: Rob Hand**

# Cow-Calf Leases

Livestock leasing is a useful management tool used by farmers to aid in production and expansion. It can encourage more efficient management by maximizing available resources. Production resources are not left idle. There are a number of lease arrangements that may be used depending on those involved and what they feel their needs are. For example a producer wishing to purchase livestock but is short on capital or a producer who has extra feed but not enough cattle.

**Lease arrangements usually fall into one of two types:**

1. **Livestock share lease** - the income from the calf crop is shared as agreed.
2. **Cash lease** - the owner receives an annual fixed payment from the tenant or renter. The tenant receives all income

**A written lease is usually desirable even when its between friends or relatives. There are advantages to leasing such as:**

FOR THE OWNER

- Can retain ownership of a herd even though not actively farming.
- Provide access to skilled management.
- Can maintain an active interest in cattle production.

FOR THE TENANT

- Can acquire animals without purchasing them.
- Allows use of resources otherwise not used to their potential.
- Enables the tenant to test one aspect of agriculture without putting up too much investment.
- Allows the tenant to develop practical experience in beef production.

**There are, however, a few disadvantages that must be weighed against the advantages.**

FOR THE OWNER

- Lack of direct control of the cattle.
- Cannot sell cows or stock on short notice.

FOR THE TENANT

- Possibility of management interference.
- Losses may occur when cattle prices fall below rental income.
- Cannot use cattle for security.

**When writing up a lease agreement there are a number of points that should be included.**

- The sharing of calves, cash rent or income split and its timing.
- Brands, tags, marks, weights and ages of cows.
- Responsibility for marketing and transportation.
- Breeding and upcoming dates.
- Responsibility for management decisions such as creep feeding, dehorning, castration and warble control.
- Responsibilities of the owner and tenant regarding culling, replacements, death loss, insurance and the sharing of certain costs.
- Naming an arbitrator to settle differences.
- Length of the lease and provisions for termination.

Despite all the above points it is possible to come to terms with a working agreement. Many individuals have successfully been part of leases for a number of years. If in doubt as to how to get started or for examples of worksheets for determining cow-calf leasing arrangements contact your nearest Alberta Agriculture office. Leasing may be an option for you, but before signing one, know every aspect of the lease as it is a legal agreement.

**Written by: Dale ZoBell**

# BEEF 'N' BACON

Alberta
AGRICULTURE

APRIL 1990

CANADIANA

MAY 14 1990

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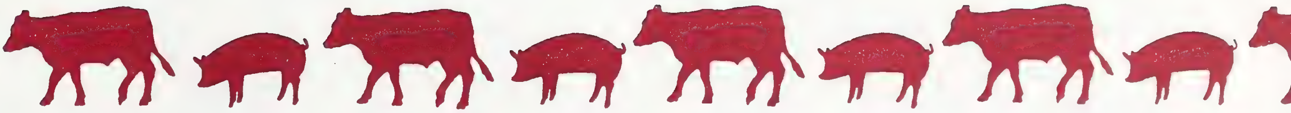

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# RED MEATS

## BE AWARE OF CONSUMER PERCEPTIONS

The most frequent consumer complaint regarding fresh meat quality is product variability, particularly in tenderness and flavour.

This problem is most acute in beef; it also occurs in pork. Tough and poor flavour or off-flavour meat causes consumers to choose another product. The alternate product used to always be another meat, but more frequently, consumers are choosing non-meat substitutes. Although some of this trend may be due to consumer concerns regarding animal welfare, food safety and food healthfulness, some of it is certainly due to poor quality product. Some authorities think the meat industries must focus more attention upon producing higher quality and more consistent products.

Consumer perceptions are extremely important, but also very sensitive and fragile. Since the consumer is the most important part of our food system, everyone involved has a tremendous responsibility to deal with the consumer openly and honestly.

In the future to ensure meat quality; measurements of tenderness, colour, and marbling of meat, might be included in carcass grading. This could result in less emphasis on just backfat and lean yield.

**Written by: Aileen J. Whitmore**

# PERMANENT IDENTIFICATION

Producers with sows in groups often have problems keeping ear tags in place. Losing tags makes record keeping and herd management very difficult. Double tagging *(the same number in each ear)* does help but there still isn't a tag that is fool-proof.

Two permanent systems of identification are ear notching or electronic identification with implants.

## EAR NOTCHING

Ear notching involves snipping small triangular sections out of the ear of a young pig to make permanent identification. Only damage to the ear by biting or frost will remove this system. The tool used to remove triangular sections of the ear can be purchased at most farm supply stores.

**Figure 1** shows how one simple numbering system works. The pig's left ear and the top of the right can be used for litter identification or day of the year. The bottom of the pig's right ear can be individual pig identification.

**Figure 2** is an example of litter 337 *(it could be day 337)* and individual pig 9. To read the notches you just add up the numbers. In this case the 300 in the right ear and the 30, 5 and two 1's in the left ear add up to 337 (300 + 30 + 5 + 1 + 1). The bottom of the right ear is 5 + 3 + 1 or 9.

Once a pig is identified, it is a simple matter of looking up a litter card and finding out the date of birth and who the parents are. This then gives a way of identifying potential gilts or working out days to market on your hogs. Once a gilt is picked she has a permanent identification in the notches. The notches, combined with ear tags, is a fool-proof system to identify animals in a sow herd.

## ELECTRONIC IMPLANTS

The latest permanent ID Systems are electronic implants that are placed under the skin. These implants are placed with a ralgun *(used to implant ralgro in cattle)* and are simple to use. One particular implant measures 3.6 m x 29 mm *(about 1/8 inch x 1 inch)*. The implants are read by an electronic pick-up device which is used to identify the animals.

## DRAWBACKS

One of the biggest drawbacks is cost. One system sold out of Ontario has a cost of $5.00 per implant and $1800.00 for the reader. Another drawback is that readers have to be close to the animal. One system still being tested will allow reading of 3 feet away which is about the best right now.

On the positive side, countries like Holland will require all hogs be identified electronically in the near future. This should bring down the cost *(probably this fall)* to around $2.00 per implant. These systems can also be used with a computer to create a record keeping system along with permanent identification. This involves punching information into the reader and later downloading into a computer for permanent records.

## CONCLUSION

As margins get tighter, it becomes even more important to have good records. Good records start with good identification. Ear notching or electronic identification *(more in the future)*, along with ear tagging, can provide a virtual fool-proof system of permanent identification.

Figure 1

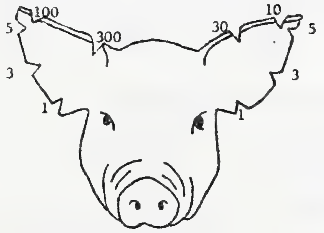
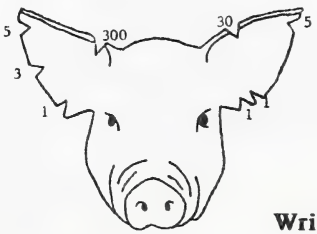


Figure 2

Litter 337
Pig 9



**Written by: Bert Dening**

# GETTING WEANERS GOING

Weaner pig management is somewhat of a "balancing act". There is no single right way to care for newly weaned pigs, but there are many methods used that result in poor post-weaning performance.

## STARTING OFF RIGHT

In order to get a good start in the weanling unit it is essential to start with a good weaner pig. There are no prizes for weaning pigs that are not ready. It is therefore essential to choose a weaning age based on the type of weaner facilities that are available. In most cases weaning pigs as a batch on the Thursday nearest to 28 days offers the greatest profitability.

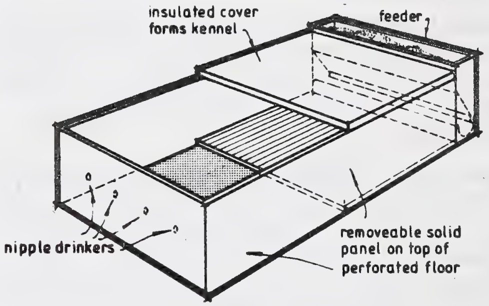
| WEANING AGE | DESIRABLE WEANING WEIGHT |
|---|---|
| **21 days** | **6 kg.** |
| **28 days** | **8 kg.** |

The above target weaning weights are achievable in every operation. Although we hope every pig achieves this weight it never happens. Pig weight variation is a major production and economic problem. Good management minimizes variations in pig weights. Without it, all too often it is the 3 kg runt that controls the operation.

## PROVIDING THE BEST POSSIBLE ENVIRONMENT

Specialized rooms for weaning pigs have become standard. When weaning pigs at younger ages, especially less than 28 days of age, high quality facilities are essential. The following guidelines should be considered:

- From weaning to 20 kg weight provide at least $0.2 m^2$ on perforated floors, $0.3 m^2$ on solid floors.
- Although single litter pens are preferred evidence suggests, group sizes should be kept at 15 pigs or feed intake may suffer.
- Draft free conditions are essential especially in the first few days after weaning. Pigs at 3 weeks require a temperature of 28-30 ° C. The temperature can be reduced by 2 ° C per week until 20 - 22 ° C is reached at 8 weeks of age.
- All in-all out housing is worth an extra 100 grams of growth per day.
- The figure shown below demonstrates an ideal weanling environment. Use overlays on the perforated floor for the first 4-5 days. Create a micro environment by covering part of the pen with a styrofoam or plywood sheet. Provide a heat lamp if necessary.


insulated cover forms kennel
feeder
nipple drinkers
removeable solid panel on top of perforated floor

Baxter 1984

## WHAT ABOUT FEEDING?

A good creep feeding program prepares the pig for the stress of weaning. In practice, if weaning occurs at three weeks or less do not creep feed. An intake of 400-600 grams of creep feed is necessary to allow the pig's gut to tolerate a post-weaning diet without developing an allergic reaction and hence post-weaning scours. If creep feeding use the same diet for the first two weeks after weaning.

- Feed ad lib. Restricted feeding can be a greater insult than post-weaning diarrhea.
- Pigs less than 9 kg should be fed diets containing milk products (i.e. 20% whey).
- Provide 1 nipple water for every 6-8 pigs.

## ACHIEVABLE TARGETS

| | |
|---|---|
| Average daily gain | 500 grams |
| Weight at 8 weeks | 18 kg. |
| Nursery mortality | <1% |

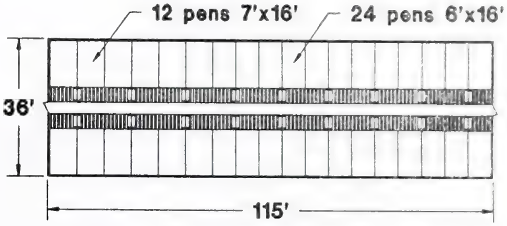
**Written by: Marvin Salomons**

# ALL IN-ALL OUT FINISHER BARNS

For reasons of preventative health care, some all in-all out batch finisher barns are being built in western Europe and British Columbia. For comparison, here are three possible pig barn layouts based on 3 litters per week or 30 pigs per week. The barns are all designed with the quiet resting area against the back wall. The manure pits can be connected at the ends to form a hairpin gutter.

## CONVENTIONAL BARN - 480 PIGS

| Grower - 8 weeks | Finisher - 8 weeks |
|---|---|
| 8 x 30 pigs/wk = 240 pigs | 8 x 30 pigs/wk = 240 pigs |
| 20 pigs /pen | 10 pigs/pen |
| pen area - 5.5 ft² /pig | pen area - 9 ft² /pig |
| 12 - 7' x 16' pens | 24 - 6' x 16' pens |



Conventional Barn

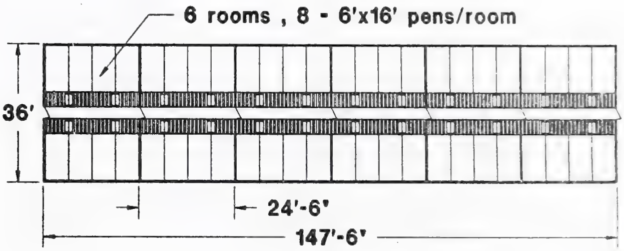
## ALL IN-ALL OUT BARNS - 480 PIGS

Barn 1 is a design that minimizes the cost of an all in-all out barn by sharing the centre alley. Barn 2 keeps all the rooms separate by using a common hallway.

| | |
|---|---|
| Grow, finish - | 110 days |
| Clean and fill room - | 22 days |
| Room Cycle - | 132 days |

Based on 12 pigs per pen, a room with 8 pens will hold a batch of 96 pigs.

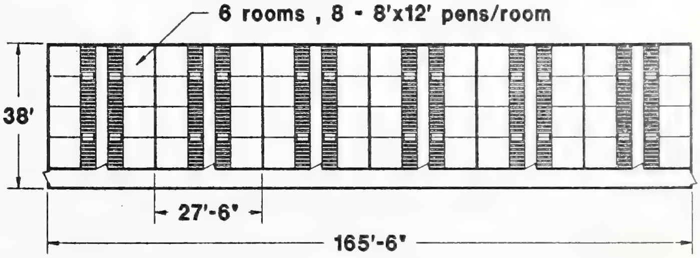
96 pigs/room x 5 = 480 pigs.
Pen area = 8 ft ² /pig.
12 x 8 = 96 ft ² /pen.



Barn 1

## COST INDEX

| | AREA | COST INDEX |
|---|---|---|
| Conventional 36' x 115' | 4140 ft | 100 |
| Barn 1 36' x 148' | 5330 ft | 130 |
| Barn 2 38' x 166' | 6310 ft | 150 |

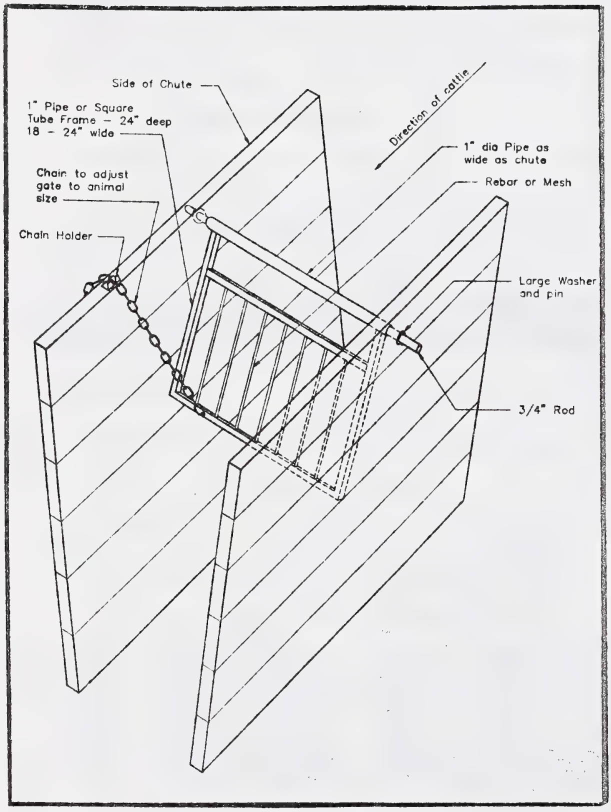


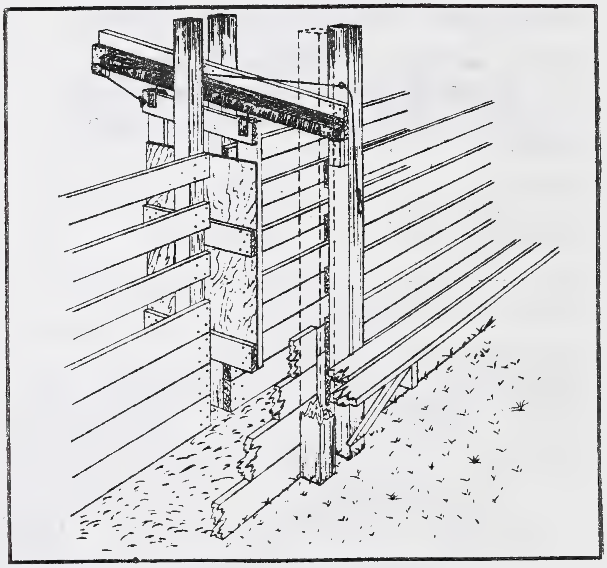
Barn 2

**Written by: Robert Borg**

# BLOCKING GATES

Here is a very simple, but effective blocking gate that prevents cattle from backing up in a single file working chute. Depending on a producer's individual needs, it might also be desirable to have a blocking gate that prevents animals from going forward. The second type of gate could be used for these situations.


Side of Chute
1" Pipe or Square Tube Frame – 24" deep 18 – 24" wide
Direction of cattle
1" dia Pipe as wide as chute
Rebar or Mesh
Chain to adjust gate to animal size
Chain Holder
Large Washer and pin
3/4" Rod



**Written by: Wayne Winchell**

# GRASS TETANY IN BEEF CATTLE

This is a disease most prevalent in late winter or early spring. It is also known as winter tetany, grass staggers, wheat poisoning, magnesium tetany and hypomagnesemia.

Unlike the *"Downer Cow"* syndrome which occurs in cattle after a hypocalcemic (low calcium) induced milk fever, grass tetany is associated with lowered levels of magnesium in the blood stream.

Rather than a simple deficiency of magnesium in the diet, various factors may be interfering with the absorption and metabolism of magnesium eg. high levels of potassium or nitrogen in the feed. Calcium, phosphorus and sodium as well as energy intake may also be involved. It is most prevalent in late winter or early spring. Recent work has shown that young, green grass has a lower content of available magnesium than mature grass, a lower content of total magnesium than mature grass and that grasses in general have a lower magnesium content than clovers and other dicotyledonous plants. It is also known that heavy application of potassium and nitrogen rich fertilizers reduce the availability of soil magnesium.

**Cattle in heavy lactation may be receiving a diet deficient in magnesium when they graze many grass-dominant, lush, heavily fertilized pastures.**

It is generally recommended that the pasture content must be at least 0.2% magnesium (dry matter basis) and if below this level hypo-magne-semia is possible.

In a recent pasture clipping study conducted throughout Central Alberta over two summers it was found that approximately 60% of the surveyed pastures were below 0.20% magnesium in May and June. Many of these pastures were as low as 0.13% magnesium - particularly in eastern portions of the region.

Cows nursing calves or close to calving are usually affected. They become nervous, or unusually alert, may develop a staggering gait and muscle twitching. Animals are often found down with the head and back legs paddling.

Animals treated early usually respond well to intravenous injections of magnesium and calcium glucomate solutions. Animals treated in the late stages of the disease often respond temporarily but fail to make a complete recovery.

Grass tetany can be controlled by providing a magnesium containing supplement of mineral, such as magnesium oxide at the rate of 60 grams/head/day (2 ounces). It could be mixed in with the trace mineralized salt. Keep the mineral boxes filled and dry and scattered at various pasture locations.

**Avoid putting cattle on pasture too early in the spring. Magnesium is more available in mature grass plants than younger ones.**

This disease is not totally understood but may be the result of a combination of factors. The worst combination, however, is inadequate energy intake (lush pasture) with a low dietary content of magnesium (grass pasture) in recently calved cows during a spell of cold, wet and especially windy weather.

There is also a variation between animals in their susceptibility so it is probably worth while to identify susceptible animals and if possible give them special treatment.

**Written by: Dale ZoBell**

# GETTING OFF ON THE RIGHT HOOF

After 24 months and several hundred dollars of investment, the replacement heifer gives birth to her first calf, a bouncing four legged fellow, up and running within hours of birth. To ensure that this happens, here are some guidelines when selecting and raising replacement heifers.

- ***Choose heifers that are born early*** in the ***calving period.*** These heifers are from the most fertile cows and may be more fertile than heifers born later in the calving period. These heifers will be older and likely larger than heifers born later in the calving period. Since puberty is a function of age and weight, these heifers should reach puberty sooner. Choose at least 25% more heifers than required.
- ***Feed to gain 1.5 pounds per day over the first winter.*** Heifers should weigh about 65% of their mature weight by the beginning of the breeding season. If mature weight is 1300 pounds, then the heifers must weigh about 850 pou1nds by the start of breeding. Feeding 4 to 5 pounds of grain plus free choice of a legume grass hay and fortified salt and vitamins will give gains of 1.25 to 1.5 pounds per day. Weigh heifers at weaning and a representative group in late winter to assess whether the ration is adequate.
- ***Watch for cycling heifers.*** Heifers should have had at least two estrus cycles prior to the start of breeding. Research from Montana shows that heifers bred on either their first or third estrus had a 57% or 78% pregnancy rate, respectively. Selecting heifers born early in the season will help ensure at least two estrus cycles occurred prior to breeding.
- ***Consider measuring pelvic area.*** Pelvic area is another piece of information that when combined with heifer age and weight can be useful in predicting what size of calf the heifer can deliver. Heifer pelvic area grows by 0.27 cm /day from yearling to two years of age. That means that a heifer calving at 24 months of age can deliver a calf weighing 5 pounds heavier, on average, than a heifer calving at 22 months of age. (Assumes a pelvic area to birth weight ration of 3.2). Again, selection of heifers born early in the calving season is beneficial.

  Pelvic areas can be measured immediately prior to the breeding season or at the fall pregnancy exam. Small pelvic area heifers would either be sold or bred to a known easy calving bull.
- ***Choose an easy calving sire for replacements.*** The sire chosen should have been born unassisted. The birth weight should be known and the bull should display characteristics for calving ease. That is, avoid large boned bulls with wide shoulders, a thick head, and thick muscles. Birth weight is about 40% heritable and considered a useful tool in assessing the offspring's birth weights. However, the same bull will throw calves whose birth weight varies by 20 to 30 pounds. Breed replacements to a bull whose birth weight was close to or up to 10 pounds lighter than your herd average.
- ***Restrict the heifer breeding season to 42 days.*** Think of this criteria as a performance test similiar to how bulls are tested but with a different measureable trait, that being, fertility. Heifers passing his fertility hurdle will be the most fertile heifers and be in the best position for early breeding in future years. An alternative to restricting the breeding season is to cull late bred heifers based on a pregnancy check or to calf out the heifers and cull those calving later than the first two cycles.
- ***Feed the pregnant heifer as if it weighed 300 pounds heavier.*** The second winter's ration can be good quality mixed hay alone or with supplemental grain. Of importance here is to ensure that competition for feed is minimal, especially if the heifers are fed with the cows. Do not restrict feed in late pregnancy to control birth weights. Feed restriction may lower birth weights but will also increase the interval to conception, lower conception rates slightly and add stress on the calf such that there is an increased risk of death.
- ***Provide well timed calving help.*** Alberta data shows that at least 30% of the heifers will have calving difficulty. Frequent observation and well timed calving help will be needed to ensure a lively calf and continued rebreeding.

**Written by: Rob Hand**

# BEEF'N' BACON

Alberta
AGRICULTURE

MAY 1990

CANADIANA

JUN - 7 1990

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Vol. 5, No. 8

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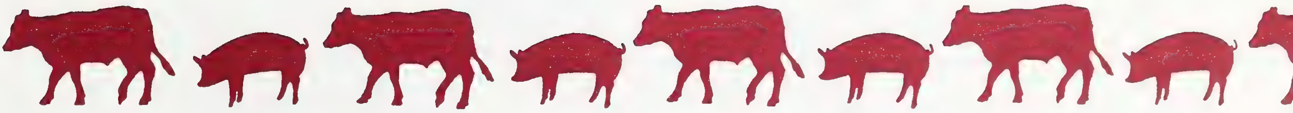

# INTRODUCTION

Beef 'n' Bacon is a winter livestock program for the North Central and North West Regions of Alberta. The newsletter's objective is to reach livestock producers with timely and pertinent topics. Beef 'n' Bacon is distributed to approximately 4,000 livestock producers and agri-businesses in Alberta. It is written and edited from the Red Deer and Barrhead Regional Offices. District Comments (optional) are added by the District Agriculturist.

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# RED MEATS

## CONSUMER ATTITUDES AND THEIR INFLUENCE ON THE AGRI-FOOD SECTOR

Nutrition is an increasingly powerful influence on food purchase decisions in today's rapidly changing market place. A recent survey of Canadian consumers confirmed that many of them correctly believe animal products are the major source of fat in their diet. Therefore, it is not surprising that for the past decade, apparent consumption of certain animal products such as red meats, whole milk and animal fats has been declining, while consumption of chicken, cheeses, partly skimmed milk, yogurt and vegetable fats has been increasing.

Generally, the survey results show the decrease in consumption of animal products observed over the last decade seems to be levelling off. Most people are not reducing their consumption of animal products any further, nor are they eliminating foods from their diets. Instead, consumers are demanding animal products that are lower in fat, such as lean, well-trimmed meats. Retailers report a growing demand for lean meats and say it is the most important trend in meats in Canada. They have predicted a 13 per cent increase in the sale of ultra-trim cuts between 1987 and 1992. The challenge for the meat sector is to develop and market more low fat products that also meet consumer demands for variety and quality.

Consumers do have some misconceptions about sources of fat according to the survey. Approximately 20 per cent of respondents mistakenly believed that margarine has less fat than butter, and only one third knew that nuts are high in fat.

Perhaps we all need to work at removing some of the negative information surrounding red meat by pointing out primary sources of fat in the diet: salad dressings, sauces, gravy, deep fat fried fast food, muffins, croissants, granola bars, cookies, and pastries.

**Written by: Aileen J. Whitmore**

# COOLING NURSING SOWS

Sow reproduction and number of days weaning to rebreeding is directly related to lactation feed intake. The more feed a lactating sow consumes the less weight loss, more milk production and less problems rebreeding. A cool sow (20 ° C environment) eats more, has less farrowing problems and fewer stillbirths.

## COOLING

As swine do not pant, they are highly susceptible to heat stress. It is very simple and inexpensive to keep a sow cool using a drip cooling system. Sprinklers in feeder barns are common in Alberta but drip cooling of sows hasn't caught on except for a few barns.

## DOES IT PAY

Kansas State University did an experiment on 29 sows allocated to either a control (no cooling) or a drip wetted treatment. The temperature in the room was above 28° C (82° F) 98% of the time so the drip coolers worked continuously. **Table 1** shows the final results of this experiment.

The following conclusions can be drawn from the results.

1. Wetted sows had lower respiration rates. Respiration rate is highly correlated to weight loss and reduced feed intake.
2. No differences were observed in number of pigs born alive, dead, weaned or piglet birth weight.
3. Drip cooled sows lost much less weight during lactation.
4. Drip cooled sows ate 0.95 kg (2 lbs) more feed per day than the control.
5. There was no difference in return to estrus.

Alberta is not Kansas and we don't have consistent high temperatures like they have. At the same time, drip cooling systems are inexpensive and many of our farrowing rooms are above 21° C (70° F) a lot of the time, especially from May to September.

The experiment only looked at 29 animals. There is plenty of evidence that large weight losses in lactation has long term effects on reproduction, longevity and general herd performance.

## THE SYSTEM

A commercial system can be purchased for $45.00 U.S. for 20 farrowing crates and $60.00 U.S. for each 20 additional crates. This works out to around $5.00 per sow for a 100 sow operation. Home made systems can be built for half this cost using a drip irrigation system, timer, electric selenoid and a thermostat.

## CONCLUSION

Drip cooling can be an effective method of cooling nursing sows in total slatted farrowing crates (solid floored crates would get too wet). Because of low cost, increased sow comfort and the reduced weight loss (because of higher feed intake) this system is probably cost effective even in central and northern Alberta.

**Table 1 EFFECT OF WETTING ON SOW PERFORMANCE**

| | | DRIP | CONTROL |
|---|---|---|---|
| Respiration Rate breaths per minute) | Ave. Resp. rate of 3 weeks | 28.5 | 63.6 |
| Litter Effect | No. born live | 11.0 | 10.8 |
| | No. dead | 0.6 | 1.4 |
| | No. weaned | 10.6 | 10.1 |
| | Litter wean weight | 56.21 kg<br>(123.92 lb) | 50.91 kg<br>(112.23 lb) |
| Sow Effect | Weight loss during entire lactation | 3.79 kg<br>(8.36 lb) | 17.48 kg<br>(38.53 lb) |
| | Daily feed intake (weight/day) during entire lactation | 5.74 kg<br>(12.66 lb.) | 4.79 kg<br>(10.55 lb) |

**Source: Kansas State University**

**Written by: Bert Dening**

# ENSURING A HEALTHY PRODUCT

Food safety and quality is under the public microscope. People from all sectors of society are much more concerned about the quality of the food they are eating. This quest for purity includes hygiene on the farm. There is a "green" movement to reduce medication useage on the farm. This means proper hygiene and disinfection is more important than ever.

Pig producers have differing ideas about pig health. Many believe that a "natural bug balance" develops in the barn and is therefore an alternative to cleaning. The natural flora are to out-compete any pathogens that may be present. This ecological approach breaks down when the ecology of the environment is disrupted. Under this approach, if a disease problem occurs it may become established in the barn and become difficult to bring back under control. A good cleaning program is associated with a reduced risk of disease.

## PREVENTION RATHER THAN CURE

It is impossible to know exactly how cost effective an efficient hygiene routine is - that is how much disease has been prevented. Studies have shown that regular cleaning and disinfection can reduce baby pig mortality by 3 to 4%. In addition, simply cleaning grower-finisher pens can reduce days to market by 7 to 10 days. Intensively housed animals are very vulnerable and will respond to reduced microbial load. It is well known that animals do better in a new or clean building.

## STEPS FOR PROPER CLEANING

STEP 1: Remove animals from area or barn to be cleaned.

STEP 2: Remove all portable equipment and litter. Clean and disinfect equipment separately.

STEP 3: Remove dust from ledges, air inlets, fans, etc. with brush or vacuum.

STEP 4: Flush out drinking lines with fresh water containing a disinfectant (i.e. 250 ppm dairy hypochlorite solution). Leave in lines for at least 10 minutes and re-flush with fresh water.

STEP 5: Switch off electricity. Protect electrical equipment.

STEP 6: Clean thoroughly. Soak all surfaces with a detergent solution. Clean by pressure hose, wet scrubbing or live steam. The use of heat aids detergency.

STEP 7: Rinse if necessary.

STEP 8: To destroy residual bacteria disinfect after rinsing. Disinfectant contact time of at least 30 minutes is necessary.

STEP 9: Rinse if necessary.

STEP 10: Let the area or barn dry.

STEP 11: Rest the area preferably for up to 14 days. If building can be fumigated do so 48 hours before restocking.

## PUTTING THE BUGS ON HOLD

The type of disinfectant selected depends on your objectives, the disease situation and the conditions under which it is to be used (see "Selecting a Disinfectant" May, 1988, p. 4). No disinfectant will work unless it can **PENETRATE** to the target organisms. It is essential that premises are **CLEANED** to a high standard (clean enough to eat off) prior to disinfection. Most of us have our own interpretation of what clean is. Effective cleaning should remove over 90% of the microbial contamination and also expose the remaining microbes to the disinfectant.

It is essential that disinfectants be used in accordance with the manufacturer's instructions. Remember, the good work done in cleaning and disinfection may easily be undone unless the following points are adhered to:

- Control entrance of rodents, birds and insects. Keep outside surroundings clean and tidy.
- Control movement of workers. Use footbaths between buildings or change boots. Restock footbaths daily. Encourage stock people to clean hands.
- Isolate unhealthy animals.
- Wash sows with mild disinfectant and rinse just prior to putting them in farrowing crates.
- Control movement of vehicles, equipment and visitors onto the premises. In some units measures may dictate prior notice of a visit, a period of quarantine or even a shower before entering.

**Written by: Marvin Salomons**

# HOW TO CONTROL YOUR BARN'S HOT WATER HEATING SYSTEM

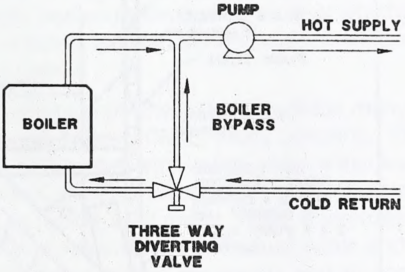
Swine barns can benefit from improved heating and ventilation control. Heating cost reduction and improved temperature regulation are two benefits.

### 1. OUTDOOR RESET CONTROL

Outdoor reset may provide all the necessary control for small systems or it may be used in combination with zone control. An example of outdoor reset control is that when the outside air temperature is 20° C, the hot water supplied to each room is 50° C. When the outside temperature falls to - 30° C the hot water supplied to each room is 80° C.

Outdoor reset is accomplished by varying the hot water supply to the barn as shown in the diagram. It is important that the water temperature does not fall below 50° C as condensation problems may occur in the boiler.

A thermostat with two sensors is used, one to measure outside air temperature and one to measure hot water temperature. The two temperatures are then used to vary the water temperature supplied to the barn.



RESET SCHEDULE

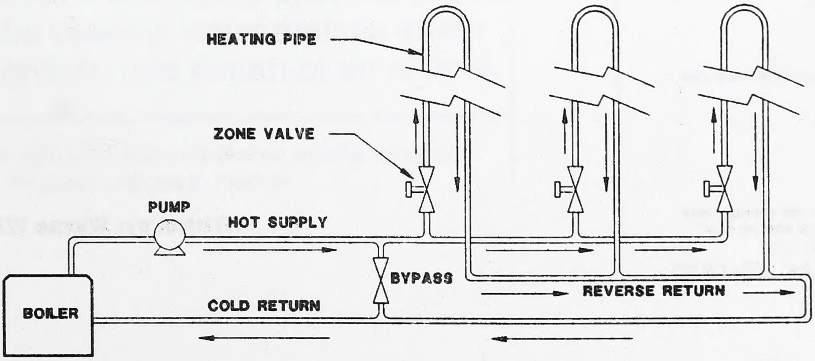
| T outside | T water |
|---|---|
| 20°C | 50°C |
| −30°C | 80°C |

### 2. ZONE CONTROL

Barns with multiple rooms may benefit from individual room or zone control.

Two way valves are used to control the supply of hot water to each room's heating radiators. Two methods to control on-off zone valves are to use a thermostat in each room to operate a motorized valve or to use a valve operated by a non-electric pneumatic controller. As each room calls for heat, the valve opens and supplies hot water to black iron pipe, finned tubing or a unit heater.

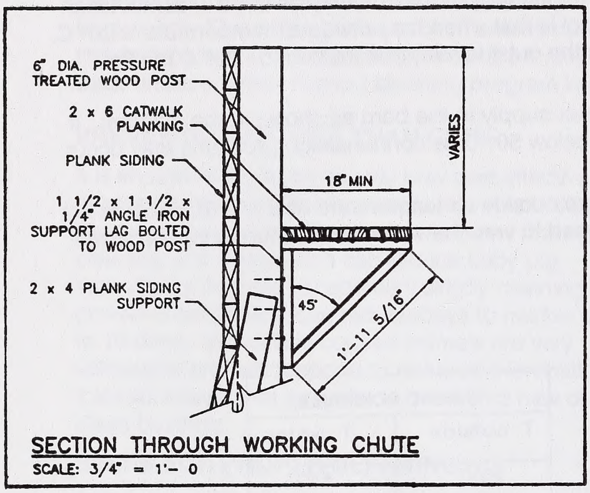
The diagram shows a reverse return piping arrangement. The water travels the same distance in each circuit as it returns to the boiler thus making balancing easier. A bypass valve operated by the pressure difference between the supply and return valves is sometimes used to return water to the boiler if the pressure at a minimum flow is three times the pressure at maximum flow.



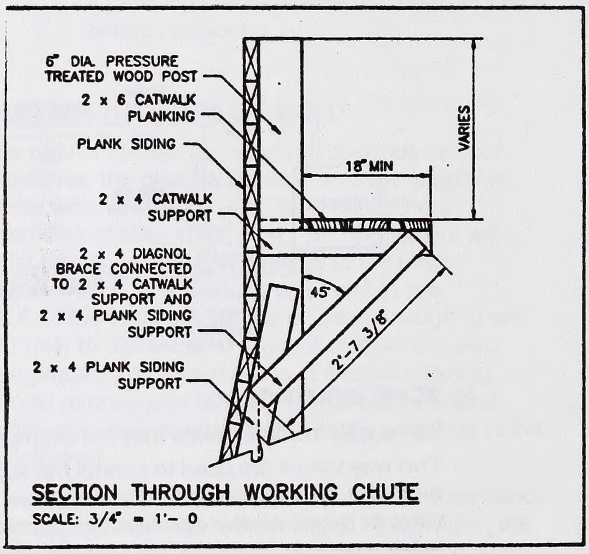
**Written by: Robert Borg**

# CATWALKS FOR SOLID-SIDED WORKING SHUTES

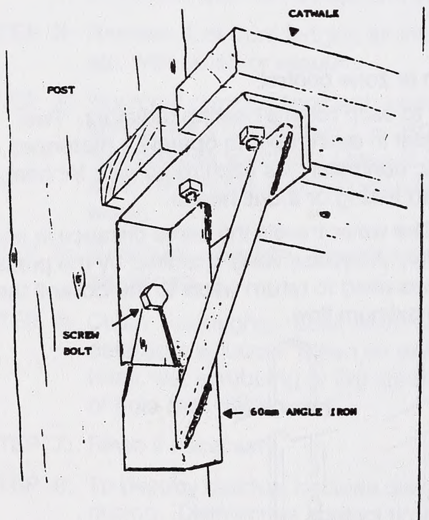
Here are several ideas for the construction of catwalks to the sides of wooden working chutes either by using metal or wooden support brackets.


6" DIA. PRESSURE TREATED WOOD POST
2 x 6 CATWALK PLANKING
PLANK SIDING
1 1/2 x 1 1/2 x 1/4" ANGLE IRON SUPPORT LAG BOLTED TO WOOD POST
2 x 4 PLANK SIDING SUPPORT
VARIES
18" MIN
45°
1'-11 5/16"
SECTION THROUGH WORKING CHUTE
SCALE: 3/4" = 1'- 0

CATWALK WITH ANGLE IRON SUPPORTS


6" DIA. PRESSURE TREATED WOOD POST
2 x 6 CATWALK PLANKING
PLANK SIDING
2 x 4 CATWALK SUPPORT
2 x 4 DIAGNOL BRACE CONNECTED TO 2 x 4 CATWALK SUPPORT AND 2 x 4 PLANK SIDING SUPPORT
2 x 4 PLANK SIDING SUPPORT
VARIES
18" MIN
45°
2'-7 3/8"
SECTION THROUGH WORKING CHUTE
SCALE: 3/4" = 1'- 0

CATWALK WITH WOODEN SUPPORTS


CATWALK
POST
SCREW BOLT
60mm ANGLE IRON

THIS BRACKET CAN BE REMOVED WITH THE CATWALK. THIS ELIMINATES BRACKETS JUTTING INTO THE WORKING AREA.

REMOVABLE CATWALK BRACKET

**Written by: Wayne Winchell**

# COCCIDIOSIS IS BEEF CATTLE

Coccidiosis occurs universally but is of most importance where animals are housed or confined in small areas. The disease is wide spread enough and sufficienty important economically in calves to warrant treatment and control measures. It has been estimated that economic losses from coccidiosis amounts to $1.00/animal (U.S.) in cattle less than one year of age annually.

Bovine coccidia have stages within and outside the host. The developmental stages in animals give rise to microscopic (oocyst) which is passed out in the manure. Under proper conditions of temperature, moisture and oxygen, the oocyst develops within 3-7 days to form a sporulated oocyst which is capable of infecting other animals. At this stage the oocyst contains eight bodies (sporozoites) each of which is capable of entering a cell in the animals intestine after the oocyst is eaten.

When sporozoites enter the cells they divide many times producing either a few or many offspring. The numbers produced depend on the species involved. Large numbers of intestinal cells can be destroyed as this cycle can repeat itself many times. Eventually the cycle stops and sex cells are produced (male and female). The male fertilizes the female and an oocyst is produced. Thousands of oocysts may be passed in the manure. Therefore, calves raised in crowded or unsanitary conditions are at great risk of becoming infected.

Coccidiosis occurs mainly in calves and is usually accompanied by diarrhea. Dehydration, weight loss, depression, loss of appetite and occasionally death may also be observed.

**Infections that fail to produce signs of the disease nevertheless affect the growth and health of an animal.**

Calves with only a slight infection usually show no signs but pass oocysts in manure.

Coccidiosis is a self limiting disease and clinical signs may subside spontaneously when the multiplication stage of the parasite has passed. Most drugs used in control (coccidiostats) have a depressant effect on the early stages of the coccidias development.

**In an outbreak clinically affected (those that show signs) cattle should be isolated and treated. An attempt should be made to reduce the stocking rate of the animals in affected pens.**

Overcrowding is a common occurrence in epidemics of coccidiosis. All feed and water should be high enough off the ground to avoid manure contamination. Mass medication of the feed and water supplies may be necessary in an attempt to stop an outbreak and minimize the rate of development of new cases.

There are several anticoccidial drugs available which may be used in addition to good management practices. These include sulfonamides, amprolium and decoquinate.

Recommendations on their use should be directed by a veterinarian who can also suggest other management and control practices.

**Written by: Dale ZoBell**

# SANDCRACKS - A PERSISTENT PROBLEM

A sandcrack is a vertical crack in the horn on the hoof wall. The crack starts at the coronary band and goes right through the wall to the laminae. The problem has been associated with the hoof wall losing its ability to retain moisture and becoming brittle. The cow's weight applies pressure to the hoof wall and a small crack develops. The crack grows with the hoof and in some instances causes lameness.

**Sandcracks are a common problem in beef cattle herds throughout western Alberta.**

The incidence could be as high as 25 to 30% of the cows having a sandcrack in at least one hoof but the average is likely less than 10%. A 1981 survey revealed that 85% of the vertical cracks occur in the front outer claw, and that animals less than one year of age did not have cracked hooves but that 59% of five year old cows did in high incidence herds. Cracks are not related to hoof conformation or hoof color. Excessively long claws, however, may be detrimental if it causes the cow to stand differently, placing extra pressure on the hoof wall.

Copper and zinc deficiencies have been identified as a possible cause for sandcracks. It is thought that when copper and zinc intake is deficient or widely fluctuates, that the cross linking of elastin and collagen proteins in the hoof wall is reduced. In response, feed companies added higher levels of these and other trace minerals to salt and range minerals. Unfortunately, the incidence and degree of sandcracks did not improve. This raises questions regarding the absorption of zinc and copper by beef cattle, whether fluctuating levels of zinc and copper are part of the cause or whether zinc and copper are involved at all in sandcracks.

Fluctuating zinc and copper intake may be a factor. Fortified salt intake fluctuates widely throughout the seasons with pasture salt intake on many farms being considerably less than winter intake. Since hoof growth is also seasonal, with the more rapid growth occurring in late spring and early summer, perhaps the two are related.

Zinc availability has been raised as a concern. Zinc oxide is most often used to supplement zinc but there is another compound, zinc methionine, which has merit. Both zinc oxide and zinc methionine are absorbed to a similar extent but the two sources appear to be metabolized differently after absorption. There have been several trials feeding zinc methionine to dairy cattle. These trials have shown improvements in hoof texture, heel cracks, laminitis, ulcers and hoof rot when zinc methionine was added. However, the improvements were small and zinc methionine is expensive.

Perhaps the sulphur containing amino acids such as methionine and cystine are more involved with sandcracks than zinc. The keratin in the hoof wall is made up of large amounts of cystine and other amino acids which are usually produced in the rumen. Methionine hydroxy analog has been fed to cattle as has sulphur, but with variable results. Feeding methionine, however, may result in softer keratin tissue and as such a more flexible hoof wall which is more effective in cushioning the cow's weight.

**Unfortunately, the underlying cause of sandcracks is presently not understood.**

Wet, rough conditions play a role in the incidence of sandcracks as could genetics. But to date, sandcracks have been considered to be caused more by the environment.

**Written by: Rob Hand**